



THE ARMY DOCTRINE AND TRAINING BULLETIN

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ENABLING THE ARMY STRATEGY WITH SYNTHETIC ENVIRONMENT TECHNOLOGY

Dr. Paul A. Roman, CD, and Lieutenant-Colonel J.L. Cyr, CD

USING SIMULATION TO ESTIMATE THE PERFORMANCE OF THE SITUATIONAL AWARENESS SYSTEM

Dr. Paul A. Roman, CD, and Major Bruce Chapman, CD

THE FOUNDATIONS OF STRATEGIC MANAGEMENT OF THE ARMY: A Necessary Return to the Military Roots of Organizational Strategy

Captain Yan Cimon

THE 1967 SINAI CAMPAIGN

Some Lessons About the Manoeuvrist Approach to Operations

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THE LIBERATION OF GRONINGEN – AN URBAN BATTLEFIELD

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THE FUTURE OF PARACHUTE OPERATIONS

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Sergeant Arthur Majoor, CD

THE CORPORALS' REPORT

Corporal W.C. Gomm and Corporal R.K. Moran

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Canada's Professional Journal on Army Issues

This is an official publication of Land Force Command and is published quarterly. *The Army Doctrine and Training Bulletin* is dedicated to the dissemination and discussion of doctrinal and training concepts, ideas and opinions by all army personnel and those civilians with an interest in doctrinal, training and other military matters. Articles on related subjects such as leadership, ethics, technology and military history are also invited. Considered, reasoned debate is central to the intellectual health of the army and the production of valid doctrine and training policies. Articles promoting thought and discussion are therefore welcome. All ranks and personnel from other environments are encouraged to contribute. Opinions expressed in the articles remain those of the author and do not represent departmental or Canadian Forces policy. The doctrine, training and other updates do not represent authority for action on that particular topic. All published material remains the copyright of the Department of National Defence and may be used with written permission from the Managing Editor.

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Contributions to the Stand-Up Table should be no longer than 1000 words and can be made anytime. Every effort will be made to publish these in the earliest issue possible. Comments on articles should be submitted as soon as possible following the publication of that article.

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Table of Contents

GUEST EDITORIAL

- REBUILDING THE CANADIAN ARMY: THE LESSONS OF SPARTA AND ATHENS2**
Sergeant Arthur Majoor, CD

EDITORIAL

- NO TIME TO THINK: ACADEME AND THE OFFICER6**
Major John R. Grodzinski, CD

- CANADIAN LAND FORCE COMMAND AND STAFF COLLEGE AND
THE CONDUCT OF ARMY OFFICER DEVELOPMENT PERIOD 211**

- FROM THE DIRECTORATE OF ARMY TRAINING
A SYSTEMS APPROACH TO TRAINING TO NEED18**
Captain Dale E.O. LaFrenière

- ENABLING THE ARMY STRATEGY WITH SYNTHETIC ENVIRONMENT TECHNOLOGY . . .23**
Dr. Paul A. Roman, CD, and Lieutenant-Colonel J.L. Cyr, CD

- USING SIMULATION TO ESTIMATE THE PERFORMANCE
OF THE SITUATIONAL AWARENESS SYSTEM26**
Dr. Paul A. Roman, CD, and Major Bruce Chapman, CD

- THE FOUNDATIONS OF STRATEGIC MANAGEMENT OF THE ARMY:
A NECESSARY RETURN TO THE MILITARY ROOTS OF ORGANIZATIONAL STRATEGY . . .32**
Captain Yan Cimon

- THE 1967 SINAI CAMPAIGN
SOME LESSONS ABOUT THE MANOEUVRIST APPROACH TO OPERATIONS36**
Major L.R. Mader, CD

- THE LIBERATION OF GRONINGEN – AN URBAN BATTLEFIELD46**
Ralph Dykstra

- THE FUTURE OF PARACHUTE OPERATIONS53**
Captain David M.G. Beatty, CD

- THE DIRIGIBLE – A PHOENIX RISING FROM THE ASHES55**
Lieutenant-Colonel Christopher Thurrot, CD, and Major Shane Jennings, CD

- FIGHTING MACHINES FOR MANOEUVRIST WARFARE AND BEYOND62**
Sergeant Arthur Majoor, CD

- THE CORPORALS' REPORT66**
Corporal W.C. Gomm and Corporal R.K. Moran

- BOOK REVIEWS86**

- THE STAND-UP TABLE91**

Part of Our Heritage

It's Cold Out There!



A Canadian militiaman dressed for winter campaign, between 1690 and 1700. (Courtesy Parks Canada)



A soldier of the Canadian Expeditionary Force during the battle of the Somme in November 1916. He wears the steel helmet introduced in April 1916 and a variety of Canadian and British uniform and kit items. A goatskin jerkin was preferred to the greatcoat for cold weather in the trenches, as the coat's long skirts would become heavily coated with mud. (Courtesy Canadian War Museum)



A British soldier serving in Canada wearing winter dress, sometime between 1765 and 1783. The coat was likely of local manufacture. (Courtesy Parks Canada)



A member of The Royal Canadian Corps of Signals serving with the North-West Territories and Yukon Radio System in winter dress, inter-war period. Soldiers assigned to this unit received Yukon pattern muskrat caps and short buffalohide coats, similar to those worn by the Royal Canadian Mounted Police. (Courtesy Canadian War Museum)

■ 2002 Army Symposium

On 21 May 2002, the Land Force Doctrine and Training System hosted the 2002 Army Symposium which examined the *Intellectual Challenges of Future Warfare*. The five speakers included Colonel Howie Marsh, well-known commentator on technology and army issues; Lieutenant-Colonel Robert Leonhard, author of *The Art of Maneuver: Maneuver Warfare Theory and AirLand Battle and The Principles of War in the Information Age*; Dr. Sean Maloney, professor of History at the Royal Military College of Canada and noted author; Dr. Paul Roman of the Army Simulation Centre; and Mr. Chris Wattie, Military Affairs correspondent with *The National Post*.



Major-General Arp provides opening comments for the Symposium. (Courtesy Base Photo, CFB Kingston)

The symposium was hosted by Major-General Jan Arp, Commander of the Land Force Doctrine and Training System, and Brigadier-General Glenn Nordick, Commandant of the Canadian Land Force Command and Staff College and Editor in Chief of *The Army Doctrine and Training Bulletin*, on behalf of the Chief of the Land Staff. The symposium organizer was Major John R. Grodzinski.

Some 100 military and civilian personnel attended from across Canada, Australia and the United States. The papers proved provocative and resulted in considerable discussion and debate. This was the second in a series of annual symposia organized under the auspices of the Chief of the Land Staff. The 2003 Army Symposium will be a major two-day event with presentations and panels involving many prominent military and civilian individuals. More details will follow in a later issue of this journal.

Special thanks are extended to Vanwell Publications for their support of the 2002 Army Symposium.



Left to right: Colonel Howie Marsh, Dr. Sean Maloney, Dr. Paul Roman, Major-General Jan Arp, Brigadier-General Glenn Nordick, Mr. Chris Wattie, Lieutenant-Colonel Robert Leonhard, Major John R. Grodzinski. (Courtesy Base Photo, CFB Kingston)

■ 2001 Army Doctrine and Training Bulletin Warfighting Essay Competition Presentation of Awards



Second Lieutenant Mark Gaillard of The Stormont, Dundas and Glengarry Highlanders receiving first prize for his essay "Some Terrible Surprises: Chemical Weapons and Manoeuvre Warfare." Making the presentation of the \$250.00 prize is Brigadier-General Glenn Nordick, Deputy Commander of the Land Force Doctrine and Training System and Editor in Chief of the *Army Doctrine and Training Bulletin*. The presentation occurred at Fort Frontenac in Kingston, Ontario. Sgt Gaillard also received top prize for the 2000 competition. (Courtesy Base Photo, CFB Kingston).

Sergeant Arthur Majoor of Headquarters, 31 Canadian Brigade Group receives second prize for his essay "Prepare for Battle: Training for 21st Century War." Making the presentation of a \$100.00 certificate from Vanwell Publishing Limited is the Acting Commanding Officer of 31 Canadian Brigade Group Headquarters, Major Mark Douglas. Sgt Majoor is also a frequent contributor to the *Bulletin*.



The Army Doctrine and Training Bulletin would like to thank all those who submitted entries to the competition and to Vanwell Publications Limited for its continued support of the Bulletin.

Guest Editorial

Rebuilding the Canadian Army: The Lessons of Sparta and Athens

by Sergeant Arthur Majoor, CD

INTRODUCTION

The nature of man is unchanging, as Thucydides wrote in his introduction to the History of the Peloponnesian War,¹ which is why the study of classical civilizations has lessons for today. The story of Sparta has lessons for the Canadian army of today, lessons in politics, economics and tactics we should examine carefully lest we follow Sparta from glory into decline and irrelevance.

In the age of classic Greek civilization, one city-state, Sparta, stood out from all the others in terms of military accomplishment. For much of that time, the appearance of the Spartan “*homoioi*” (in Greek meaning “equals”) on the field of battle struck fear in all who stood against them. The reputation was well deserved. During the Persian Wars, the Spartans won eternal fame at Thermopylae, where Leonidas and the “three hundred” fought to the last man in order to delay the invaders. The Spartans defeated the larger and wealthier Athenian Empire during the Peloponnesian War and were the core of Xenophon’s “ten thousand” during the long march to the Black Sea. Even two centuries later, during the Punic Wars, the Carthaginians hired the Spartan mercenary Xanthippus to organize the army. He is credited with defeating Regulus’s Roman army outside the walls of Carthage in 255 BC.²

Yet for all their marital prowess, the Spartans ultimately left little for posterity. There is no Spartan Acropolis and little Spartan art, literature or philosophy. The Spartan hegemony established after the end of the Peloponnesian War was short lived, only breeding hatred and contempt for

their brutal policies and dependence on Persian support, while enemies gathered to break Sparta’s dominance. New battle techniques made the once feared Spartan “*similars*” impotent, and Sparta lacked the resources and will to change with the surrounding world.

THE RISE AND FALL OF SPARTA

Some common threads unified the city-states of classical Greece. Language, culture and religion were shared as well as a world-view revolving around the ownership of small plots of farmland.³ Sparta shared the language and religion of its neighbors but was a nation of slave owners who had conquered the areas surrounding Sparta and enslaved the inhabitants (known as *helots*) to provide agricultural workers. The city was both physically and culturally isolated from the rest of the Greeks, who looked on the mass enslavement of fellow Greeks with distaste.⁴ Surrounded by potentially rebellious slaves, Sparta assumed the characteristics of a city under siege. Each year the Spartans ritually declared war on the *helots*. Each year all the young Spartan men who came of age left their

*... Canada’s triumphs are largely
illusionary...*

homes and joined a communal mess, where they would live until at least thirty years of age, drilling and practicing the arts of hoplite battle, primarily in order to be prepared to crush any *helot* uprising. Even after their thirtieth birthday, Spartan men were expected to spend most of their time and energy with their comrades in the mess rather than establishing a home. To maintain domestic order, a fearsome secret police kept watch on the *helots* as well as monitoring the Spartans themselves for any deviant or heretical tendencies.

The years of drill and communal living gave the Spartan “*equals*” a cohesion that was lacking in the citizen armies of other city-states. The Spartans judged their peers by their steadiness in battle, since advancing in formation with shields locked to protect the man beside you was the key to winning a *hoplite* battle. The Spartans did not bestow the award of valor to Aristodemus, who rushed out of the battle line during the battle of Plataea to fight the Persians single-handed; rather, men were warned to return either with their shields or upon them. Spartans also taught their peers to endure fear, hardship and depravation without complaint. While waiting for the Persian army at Thermopylae, the Spartans prepared for battle by combing their hair and exercising. When warned of the clouds of Persian arrows that would cover the sun, a Spartan wit reputedly said: “Then we can fight in the shade.”

But the legendary Spartan hardiness and ferocity in battle wasn’t enough to raise or maintain Sparta as a leader of Greece. The Spartans may have won glory at Thermopylae and contributed to the Persian defeat at Plataea, but it was Athens, with its vibrant democracy, commercial culture and maritime empire, that became the leading culture in Greece. Sparta’s cultural isolation made it less attractive as a model for the other Greek city-states, and its agrarian slave economy was not capable of supporting a large population or attracting and sustaining a large contingent of allies and tributaries the way the Athenians could. The Peloponnesian War was partly a reactionary struggle to oppose the growing power of Athenian democracy. The victory for Sparta came at an enormous cost, as the ranks of the “*equals*” were bled white, the Spartan

treasury depleted, and Sparta itself became dependent on the financial support of the Persian Empire to continue the struggle. Indeed, the Athenians had the economic resources, cultural flexibility and resilience to continue fighting for nine years after the disastrous Sicilian expedition destroyed the flower of their army and fleet.

The continuing struggles also highlighted the declining utility of the Spartan military model. A Spartan phalanx was forced to surrender to light troops at Pylos in 425 BC,⁵ a feat most Greeks had thought was impossible. During the retreat to the Black Sea, the "ten thousand" found themselves handicapped by a lack of cavalry and missile troops. Xenophon⁶ rectified the problem by impressing fifty pack horses to make a scratch cavalry force and offering extra pay to any Rhodian in the army who would volunteer as a slinger.⁷ During the Corinthian War, the Athenian general Iphicrates once again defeated a Spartan phalanx using light troops. In 371 BC, Spartan power was broken by the Thebans, who used *hoplite* heavy infantry in a novel, articulated formation: Epaminondas weighted the Theban left wing 50 deep and advanced the Thebans in echelon, crushing the Spartan right wing at Leuctra before the full might of the Spartans and allies came into action.⁸ Humiliated in battle, stripped of their *helots* and agricultural land, and with a declining population and economy, Sparta's influence faded, and the city became a source of mercenary soldiers and commanders through the end of the classical Greek civilization, and in the Hellenistic civilization that followed. The phalanx, once the supreme instrument of Spartan military power, became one element in increasingly large and exotic Hellenistic armies until finally overthrown by the new and very different Roman legion.

THE CANADIAN PHALANX?

The story of Sparta has lessons and implications for Canada's army. Our soldiers are inheritors of a fearsome military reputation earned in South Africa and the wars of the 20th century, sustained during the Cold War

against the Soviet Union, and burnished by a series of small actions in former Yugoslavia and Afghanistan. We are physically and culturally isolated from the mainstreams of Canadian culture in bases removed from urban Canada. We do not receive enough funding from our government to sustain the ever-growing commitments of the post-Cold War environment, and indeed, the Canadian economy as a whole is progressively declining. Although we have professional journals like *The Army Doctrine and Training Bulletin* for the dissemination of ideas, our organization and training still reflects the Cold War far more than the new security environment. Even in terms of political influence, Canada's triumphs are largely illusory, as major powers refuse to sign the "Ottawa Convention" (land mine treaty) or they ignore the International Criminal Court. Canadian soldiers are sent out not to support Canadian interests represented by such treaties; rather, they are sent to support the interests of our allies or the United Nations in the manner of mercenary soldiers for hire.

THE CIVIC MILITARY

This negative portrayal can be altered through a sustained effort on our part. The most dangerous problem affecting Canadian defense is the growing cultural divide between the military and the civilian worlds. High-sounding phrases about our need to reflect the nation we serve overlook the fact that we *do not* reflect modern Canada. The Armed Forces are about providing decisive action, not building consensus. Military leaders at all levels are, and must be, trained in the art of decision making, not debate. Every recruit has equal opportunities to demonstrate merit, not guaranteed equality of outcome. Effective use of military power is often dependent on detailed knowledge of history, economics and politics, disciplines that are fading in the public schools and universities of the nation. Even how we interpret information is different, since "[I]t matters less what you read than where you live and where you come from, because that determines how you interpret knowledge."⁹ These and other traditional skills and mindsets



Carl von Clausewitz (1780-1831) has stimulated generations of soldiers, statesmen and intellectuals over the very nature and conduct of warfare. The various revolutions in military affairs have given new technologies and capabilities, but no overarching intellectual or doctrinal framework has emerged. How can an army that does not study military theory even begin to contemplate these issues?

are the source of our strength, and need to be defended as a necessary part of military culture. Yet how much better if we were to carry the debate the other way, not just to defend our culture, but to promote it in other aspects of Canadian life?

In order to do so, we must leave the cloistered environment of the military society and interact more fully with the Canadian public. Flashy recruiting videos and meaningless slogans (Proud of what? Strong, how?) must be replaced by a dense network of links to the greater community. The Militia is already present in communities across Canada, although in miniscule numbers. Encouraging Militia soldiers to act as ambassadors in their schools and places of employment, and dramatically increasing the role and scope of the Canadian Forces Liaison Council to interact with local educators, businesspeople and politicians would be a good opening step to teaching Canadians about our culture. Training for operations in urban environments as preparation for peace enforcement missions and Operations Other Than War (OOTW) would bring us in direct

contact with the public, focusing interest and debate on the primary role of the Armed Forces, rather than secondary duties like peacekeeping and humanitarian relief. Even higher education can be enlisted in our efforts, if elements of leadership training are promoted as credits towards gaining degrees or diplomas. The amount of debate and discussion raised in colleges and universities over that proposal will certainly open many eyes to the needs, ideals and philosophies of the military. Feedback, both positive and negative, would also sharpen our focus on what Canadians really want from their military establishment, and allow us to move forward with realistic goals, rather than operating in a near vacuum. Without this sort of interaction and knowledge, we cannot communicate our needs, gain public support for our projects, or even attract new recruits. "Young people I talk to don't think badly of the CF. They don't think of it at all."¹⁰

Opening channels of communication to the larger community will give us more forums to demonstrate what we need in the way of resources to accomplish our tasks. Under funding and neglect have reduced the strength and flexibility of our military, and with it, much of Canada's international standing and influence. Despite that, there is no public understanding or political will to change the situation. We need to engage the public in serious debate on defense, and point out the resources needed to fulfill that role. The taxpayers need to understand the value of the military to Canada, and to understand what they are being asked to pay for. We also need to enter the larger political arena, not as soldiers, but as taxpayers and citizens ourselves. Canada's long-term economic decline can be traced to a cluster of causes, notably high levels of taxation and government regulation. The long-term effect of our economic decline will be an ever-diminishing pool of resources for defense, also education, health care and other basic services. An impoverished nation will not have the ability to provide proper defense and security for its citizenry. Relying on neighbors and allies to provide defense and security can only

mean decreasing Canada's sovereignty and freedom of action both within and outside our borders, and discounting Canada as a participant in world affairs. Defense is not only about soldiers and weapons, but also about the economic resources to field and maintain them.

BUILDING THE NEW PHALANX

Our long-term survival as a viable military force also requires us to look inwards. The Cold War paradigms are no longer valid, but what do we have to replace them? Our current structures were created for conventional conflict and the Cold War, but are they relevant to today's security environment? The stunning growth of transnational terrorist movements is a threat we can only deal with in a very limited fashion. Without changes, perhaps radical changes, our soldiers may find themselves unable to come to grips with the elusive terrorist enemy, like the Spartans defeated by a hail of arrows, spears and sling stones on Pylos. Neither can we ignore the increasing changes in organizational theory and conventional battlefield technology. Will some future Canadian commander suddenly realize, like the Spartan King Cleombrotus at Leuctra, that the seemingly conventional forces advancing on him are actually trained and organized very

... doctrine must not only be developed and understood, but also applied.

differently from his own? Current attempts to graft items like HUMINT teams, CIMIC cells or suggestions to re-role reserve units to provide internet support to conventional units are like Xenophon's impressing fifty pack horses to make a cavalry screen for the "Ten Thousand." Such ad-hoc arrangements may work for a while, but are they flexible and robust enough to be effective in the long term?

In the short term, adopting modest changes in equipment, organization and training could have enormous impact. Consider that in the American Marines, a company commander can have up to six radio nets in his

command post (MFC, FOO, FAC, naval gunfire coordinator, company and battalion nets), and every Marine lance corporal is trained and expected to be able to call air and artillery fire for the company.¹¹ Marines are equipped with many of the same weapons and equipment we have, from LAV infantry carriers armed with 25mm Chain Guns to F-18 fighter/bombers, so it is not an impossible task to quickly adapt some of these ideas about organization and training for our own forces. Other Armies may have equally interesting and adaptable ideas.

For the longer term, the Army has adopted manoeuvre warfare as the basis for doctrine, but has yet to have fully worked out and articulated all the implications of using this cognitive tool. Manoeuvre warfare theory as a cognitive tool to develop doctrine is a means of framing questions and deriving answers for many levels of war. Asking ourselves what we need to do to achieve manoeuvre in a particular situation helps define how we should frame orders, organize formations and plan support in operations. In peace support operations and OOTW, the ability of military formations to preempt and frustrate the activities of local warlords, crime bosses and black marketers is of great importance to achieving stability.

Although opponents in these scenarios probably cannot be attacked in the conventional sense, military forces on the ground, in conjunction with other organizations, can work to disrupt the opposition through identifying their structures and working to deny key capabilities.¹² This corresponds to the manoeuvre warfare precepts of finding gaps, preempting operations, and disruption of enemy command, control or logistics. Sudden cordon and search operations aimed at shutting down "bomb factories" and arresting the technical specialists can be considered a form of manoeuvre operation.¹³ On a strategic level, Canadian manoeuvre operations in peace enforcement would expand to include the identification and arrest of "players"¹⁴, and information operations to deny fund-raising and other support from individuals and communities in Canada to factions in theater.

A sustained process of experimentation and debate needs to take place at all levels of the Army in order to develop manoeuvre warfare doctrine as a basis for framing orders, organizing formations and planning support for the Army of Tomorrow and the Army of the Future. The doctrine must not only be developed and understood, but also applied. British writers such as J.F.C. Fuller and Basil Liddell-Hart developed armoured warfare doctrine in the 1920s and 30s, and Soviet theorists such as Marshal M.N. Tukhachevskii expounded on "Deep Battle," but neither the British or Soviet armies had applied these doctrines, with disastrous results at the beginning of the Second World War. All the armies of the Second World War had tanks, aircraft and radios, but only the German Army initially created an organization capable of integrating the use of these and other elements. The Spartan *hoplite* heavy infantry was unquestionably the best in Greece, but the Spartan inability to adapt *hoplite* organization and tactics to changing conditions eroded the utility of their phalanx to win battles and influence events.

CONCLUSION

The Spartans, isolated by their location and culture, refined *hoplite* warfare into a terrifying instrument to impose their will on the

helots and rival Greek city-states. Their success was limited by their single-minded approach to war and politics. In the end, they could not muster the economic resources to sustain themselves as the leading power of Greece, but fell under suspicion for their use of Persian money, and brutal policies towards conquered city-states. Their influence in Greece also waned as the Spartans failed to adapt to changes in the military sphere. The massed phalanx was not fast enough to deal with light troops, strong enough to meet enemy *hoplites* advancing in dense masses, or flexible enough to meet articulated formations. Ultimately leadership went to the city-state which did have the cultural flexibility to change and adapt, and the economic resources to carry on: Athens.

The Canadian Army faces many of the same problems in modern form. The key to avoiding the same fate is to break our physical and cultural isolation from the mainstream of Canadian culture, not by indiscriminately adopting current values, but by questioning and debating their values, and offering our values and philosophies for open debate. The act of articulating our values will bring them into focus for both parties. The integration of military and civilian philosophies and values will energize the military culture, making us more

flexible thinkers when trying to address internal problems, and better citizens who can offer insight and actions to address the pressing problems of the nation. Just as globalization and the Information Revolution have overthrown barriers between national economies and people, energizing the global economy, we need to overthrow the barriers that separate us from the rest of Canada, energizing both the nation and ourselves.

The Athenians had a much different ideal than the Spartans, and their vibrant culture resonates with us even today. We can rebuild the Army by integrating with the nation and calling on the contributions of all Canadians. The Athenian statesman Pericles perhaps summed up the ideal qualities of citizenship best of all in his Funeral Oration, saying: "What I would prefer is that you fix your eyes every day on the greatness of Athens as she really is, and should fall in love with her. When you realize her greatness, then reflect that what made her great were men with a spirit of adventure, men who knew their duty, men who were ashamed to fall below a certain standard."¹⁵ As soldiers and citizens, it is up to us to take up the challenge.



NOTES

1. Thucydides, *History of the Peloponnesian War*, 1.22. Translation by Rex Warner, Penguin Classics, 1972. p. 48. "...if these words are judged useful by those who want to understand clearly the events which happened in the past and which (human nature being what it is) will at some time or other and in much the same way, be repeated in the future."
2. Victor Davis Hanson, *Carnage and Culture*, Doubleday 2001, p. 112.
3. Victor Davis Hanson, *The Other Greeks*, Free Press 1995, provides a fascinating introduction to this theory, and how farm ownership and intensive agriculture established the foundations of Western civilization.
4. This was not to say Greeks were against slavery, but regarded it as a form of personal misfortune, not something to be systematically applied to an entire people.
5. Thucydides, "History of the Peloponnesian War," 4.1 to 4.41. Translation by Rex Warner, Penguin Classics, 1972. pp. 265-290.
6. Xenophon, *Anabasis*, Translation by Rex Warner, Penguin Classics, 1965. p. 97. Xenophon was an Athenian, which helps explain his adaptability under very trying circumstances.
7. Xenophon, *Anabasis*, pp. 115-116.
8. John Warry, *Warfare in the Classical World*, Salamander 1980. pp. 60-66.
9. Robert D. Kaplan, *An Empire Wilderness: Travels Into America's Future*, Vintage, 1999, p. 11. A quote by Major Susan P. Kellet-Forsyth, one of the officers Kaplan interviewed at Fort Leavenworth.
10. Col Gordon Grant, quoted in *The Report*, Feb. 5, 2001, p. 54.

11. Personal observations gained when working with "D" Coy, 4 LAR during Exercise ALLIED SABRE in Wainwright AB, 23-30 Aug 2002.
12. Thomas A. Stewart, "America's Secret Weapon," *Business 2.0*, December 2001, pp. 58-68. The sidebar on p. 63, demonstrating the use of InFlow software to map the connections and reveal the September 11 suicide attacker's network is the counterpart to "recce pull."
13. Thomas A. Stewart, "America's Secret Weapon," *Business 2.0*, December 2001, p. 64. Dutch criminologist Peter Klerks is quoted as saying "target their process and technology; if you shut down one supplier, the bad guys have to find a new one. That *disrupts their operations* (added emphasis) and creates the potential for security leaks." A sidebar on the same page describes how organizational and procedural changes in the New York City Police Department helped cut crime by 52% in a decade.
14. Patrick Graham, "Canadian Warlord," *Saturday Night Magazine*, December 1997 pp. 56-70, 94-96. Gojiko Susak was a Croatian immigrant to Canada, who raised money and support in Canada for radical actions in Croatia that helped inflame the growing civil war in Yugoslavia. Later, as the Croatian defense minister, he was responsible for Croatian actions against UN Peacekeepers, including the PPCLI. Identifying and neutralizing such people in Canada will help defuse incidents elsewhere in the world.
15. Thucydides, *History of the Peloponnesian War*, 2:43. Translated by Rex Warner, Penguin 1954, 1972, p. 143.

Editorial

No Time to Think: Academe and the Officer

by Major John R. Grodzinski, CD

During the preparations for the change of command of an ancient and proud regiment, a committee was formed with the task of selecting a gift for the outgoing commanding officer. The committee took this tradition of presenting a gift from all ranks quite seriously and a number of sub-committees were established to consider various options. After each sub-committee had completed their deliberations, the committee met as a whole to consider the ideas. When it came time for one report, the chair rose with a forlorn expression on his face. Unfortunately his sub-committee had learned their choice of a gift was no longer possible. When asked why, the sub-committee head advised all that “we were to have given the colonel a book as his departure gift. Unfortunately we discovered he already has one.”

While the provenance of this story is unknown, it aptly illustrates the sorry literary culture in the Army. While some officers proudly maintain that they have successfully conducted their duties and advanced without the need of any post-secondary education, they are unable to see the cost of their limited interest in intellectual development. Dr Doug Bland’s study of the Chiefs of Defence Staff, provides a wonderful passage on the price paid for this omission:

“Since 1950, no service Canadian Forces Officer above the rank of colonel has written anything beyond descriptive articles and none that challenged even mildly the extant views of strategy in NATO, NORAD or the UN or made anything but safe recommendations for national policy. The paucity of intellectual activity in their chosen profession paints the Canadian officers corps as a body that is either thoroughly cowed, completely lacking in imagination, or uninterested in its profession.”¹

A phenomenon of the post-Cold War era is that need for a national military strategy. At one time, NATO established strategic and training policies and ours simply responded to this lead. The Canadian brigade stationed in Europe was trained, exercised, deployed and employed by standards developed by the alliance, while Canadian-based units trained to those same standards. In some ways, this made it easier. Now things have changed. While NATO partnership is still important, Canada is frequently despatching forces to a variety of missions. This crushing tempo demands a clearly articulated national strategy—not just a business plan—but a strategy that means something. Indeed recent policy initiatives indicate that some strategic thought is developing. Curiously in attempting to do so, we have somehow confused “strategy” with business planning and management practices that confuse “stakeholders” with those actually having a vested interest in the outcome. In an era where the armed forces are attempting revolutionary change in an evolutionary manner, perhaps we should, to paraphrase Scot Taylor, employ a stakeholder with sufficient detachment to make the changes we need to bring us into the new millennium.

The topic of this commentary is the educated officer corps. Although the comments in this presentation can be applied to officers serving in all environments and capability components, they will be directed more towards the Army as its officers have traditionally displayed the least interest in academic pursuits. As stated by one critic, “the military will move towards a totally university-educated officer corps because we have been told to, not necessarily because there has been any demonstrated reason to do so.”² Clearly not everyone is convinced of the need of such training. The word “training” is

used purposely. “Training is the process that forges soldiers, materiel and time into combat ready units and formations. Such a process requires an effective, efficient army training system that produces the combat capability and readiness outputs for all elements of the force, as defined in the defence planning guidance.”³ The army *trains* its soldiers. The current methodology has three components: Preliminary training introduces the task at hand, the baseline knowledge and standard operating procedures; the Practice Stage brings “teams” to the required competency level in accordance with pre-established standards; finally Confirmation of the skill set is achieved by assessment and review.⁴

In the end, this is what training is about. It is designed to meet the operational needs of the army, ensuring sufficient competency in a myriad of skills to suit the diverse requirements of the spectrum of conflict. So if the army trains, can it educate? Where does academe fit? Do military leaders understand the difference between the two or will we be subject to such Educational Objectives as “Discusses Clausewitz in the context of Nineteenth Century European Philosophy”?

There is also the question of the practicality of a degreed officer corps. Is there utility or futility in insisting that every officer have an undergraduate degree? Junior officers, one could argue, should be allowed to concentrate on learning actions on the dismount, the conduct of just-in-time logistics or conducting training. Having a wider framework may help, but their duties do not demand it—at least not yet. A junior officer should be made combat ready and given experience while still filled with youthful vigor (“piss and vinegar”). Given time, that officer will be involved in higher issues: operational or strategic matters will

occupy a greater amount of his or her time, which will demand greater knowledge and skills that may not be developed in the field. So while an education may have limited use for the junior officer, executive leaders and their staffs will require it; but providing it to them when they become senior leaders is too late. They cannot suddenly become knowledgeable, gain critical thinking skills or cognitive powers. While junior officers may have no time to think, senior officers have no time to try. They must think. Officers must receive an education early in their career that is then developed, expanded and exercised. Education is an early investment in a long-term capability. The question then may not be "is there time to think?"; rather from both the individual and institutional perspective, it is one of when should one begin to think?

What then does an education offer? Firstly, it imparts knowledge. By its very nature, we develop a greater awareness of the world around us, the development of thought, science, the arts and humanities. Not only will this make us more interesting in the mess (as someone once said to me, if all else fails, there is always Shakespeare), but also allow new perspectives or contextual understandings. In gaining this knowledge we gain an appreciation for how ideas are formed and expressed. By writing, discussing and debating, we can learn to not only frame an argument, but to listen to one. This leads to what I believe is the most important product of education, robust and incisive thought processes. Now some may disagree with my view of what academia has to offer, but against the training model we currently have, it is a bold step forward.

If we do not develop the skills to think, we will become the intellectual subjects of others. Should our forays into the operational level of war involve more than simply adding vowels to the text in American manuals, translating them into French and publishing them as our own? How will we develop our own military thought? Allow me to expand on this point by reference to a writing board held recently in Kingston. A number of senior officers had

gathered for a board responsible for preparing the occupational specifications for army colonels and general officers. The only literature they could draw upon for a framework was an article from the *Army Doctrine and Training Bulletin* titled "An Analysis of Strategic Leadership."⁵ While as the Managing Editor of the Bulletin I was proud to see an article put to such good use, it seemed peculiar, that after three years of publication, no officer had commented on this subject. The master-corporal who wrote the article (and who is a graduate of the War Studies Programme at the Royal Military College of Canada) not only wrote an excellent piece, but also made an important contribution to the literature on leadership and to the Army.⁶ It is interesting to note that despite numerous solicitations to write articles and commentaries for the *Bulletin*, the senior leadership has remained silent. The majority of articles come from lieutenant-colonels and below (and increasingly non-commissioned members) who have completed or are supportive of undergraduate and graduate level degrees. Maybe there is hope.

IS THERE A MISUNDERSTANDING OF WHAT A DEGREE DOES?

So is there a misunderstanding by both sides as to what a degree offers? Field Marshal Alexander once suggested to a colleague in Italy, that to the British the Americans might be seen as the Greeks saw the Romans. They—the Romans—were large, loud and lacking in refined culture, while the Greeks represented a more cultured society. In some ways the non-degreed officer is cast as a Roman, strong, aggressive, proud and capable, while his degreed counterpart is seen as a Greek, minus a consonant. In this analogy, experience is more valuable than education. Until recently, the Canadian officer corps has come from a variety of educational backgrounds and enrolled through a number of programmes, resulting in a mixture of high school, military college, civilian college and university educated officers. In the grand scheme of things, a degree was not important to success, while post-graduate training was viewed as a waste. Even worse were the technically educated

staff officers who were forever banished to National Defence Headquarters. Thus when in the 1990s serious discussion of the degreed officer corps was initiated, those without degrees were suddenly told that despite whatever professional success they had achieved, they lacked a qualification that fundamentally conflicted with their notions of good soldiering.

Further proof of the misunderstanding of these developments manifested itself in seeking shortcuts to obtaining a degree. Why could "credits" not be granted for courses that hinted at some academic content? Examples were professional development programmes, certain technical training, courses offered by the Canadian Land Force Command and Staff College or the Canadian Forces College. Essentially, academic credit would be granted for military training, no matter how spurious its academic content was. Other officers, while supporting the new initiatives, were critical of the volume of reading, particularly for graduate level courses. Surely fewer readings could lend themselves to adequate seminars.

What then is the fate of the degreed officer and how effective will the new developmental system be? While not perfect and remaining cognizant of the ultimate use for armed forces, I feel that if the new system being developed is properly conducted and matched by effective career management, we will make great strides. The tide is turning.

The new Army Professional Development System is built upon a foundation of a professional body of knowledge consisting of CF and environmental specifications, which are added to warfighting skills and then leadership skills. Upon this foundation are the four pillars of the Professional Development System, education, training, experience and self-development. The level of skill and knowledge is based upon rank. For officers, the system is based upon four Developmental Periods or "DPs." Officer Cadets make up the first DP level; junior officers, group two; majors and lieutenant-colonels group three

and finally colonels and general officers, DP 4.⁷ The educational requirement increases as the DP level increases. Normally in DP 1, the officer cadet is working towards an undergraduate degree, while in DP 2, second lieutenants, lieutenants and captains, hold an undergraduate degree. In DP 3 it is anticipated that all officers will eventually hold a master's level degree, while in DP 4 selected officers will be selected for doctorate level programmes. While there is some flexibility in what degree is held when, there is nothing to be gained by exceeding the educational requirement for a DP level. While an officer may be assessed as mastering the warfighting skill set requirement for that DP level, nothing is awarded for exceeding the educational requirements for that level. This system allows for maturity and experience to be applied against further education, but will graduate level degrees come too late?

As an officer advances through Development Period levels, the requirement for higher thinking skills and knowledge increases. The role of the platoon commander demands the mastering of basic infantry tactics, techniques and procedures. Understanding the forms of a platoon attack are more important than familiarity with the evolution of doctrine or whether or how the conduct of operations may be affected by revolutions in military affairs. A platoon commander works in the world of immediacy. This or that must be done—now. There is little debate or time to think. However, as our young officer progresses, the demands on him will change. His understanding of military matters widens. He must not only know the tactics, but understand how they developed, what may be flawed and how external factors might change them. The officer must not only express these ideas with his peers in the mess, but also be able to develop and defend a position in the workplace, often before superiors. The officer must leap from the world of PowerPoint bullets to well crafted and articulated arguments. He must have an ability to conduct the necessary research, interpret a large volume of material, be open to differing perspectives and present a workable product.

Clausewitz recognized that any complex activity, if it is to be carried on with any degree of virtuosity, calls for appropriate gifts of intellect and temperament.⁸ Although Clausewitz's discussion in *On War* centers on "genius" and the courage to make decisions, he does recognize that the conduct of war requires powers of intellect—an intellect "that, even in the darkest hour, retains some glimmering of the inner light which leads to truth."⁹ For Clausewitz then, intellect was but one factor, albeit a very important one, in the makeup of the military leader. Determination, courage ("the courage to follow this faint light wherever it may lead") and other factors result in the Coup d'oeil—the ability to quickly separate the wheat from the chaff and to act. Unfortunately, our staff training and promises of new digitized command and control systems do not support the development of this capacity. They seek the removal of the fog of war and promise a clearer picture of the battlefield. Uncertainty makes war complicated and even as more information is gleaned, we are made more or less uncertain.¹⁰

Along with degree programmes, military institutions, such as staff colleges, may do much to aid intellectual development and decision-making skills. Until recently, the Canadian Land Force Command and Staff College, offered a professional development package in both the Staff Course and the Command and Staff Course. It exposed students to primary document research, discussion and debate on operational and strategic issues, the preparation of papers and consideration of a variety of subjects. Academics, theorists and pundits addressed the courses. Students were given preparatory readings and allowed to ask questions. Syndicates discussed these topics. These initiatives were a step in the right direction. I would argue that their value was diminished by insufficient preparation on the part of most students. Reading packages were not always read or studied. Too little time was allowed for discussion or too narrow a view was enforced. To many students this was the first experience in this type of environment since joining the army. Sometimes the readings were

too narrow. For example: "base your discussion on chapter two, para 5, subparagraphs a and d." Creative thinking or unconventional views were not entertained—even if supported by reference to operational research or other data. Ask a group of armour officers on the advantages of wheels over tracks and you will get my point. As hard as they tried, the Directing Staff—or at least this generation of them—suffered a similar lack of breadth to discuss these subjects and could not always offer a robust, developmental *teaching* environment. Until 1997, the Staff College trained officers to write orders and directives; now they were being taught to write persuasive, argumentative papers. Attempts to make the staff college add an *educational* capability to a training college has had mixed results and may have been hampered by the lack of any full-time academic staff members and adequately prepared instructors.

While the Canadian Forces College in Toronto offers a better programme, supported by academic staff, some of the courses suffer the problems of the Canadian Land Force Command and Staff College. The Toronto warrior monks attending the Command and Staff Course have several advantages over their comrades in Kingston. They are exposed to a variety of speakers and subjects, and are allotted considerable time to think: half of each day is provided to review readings and prepare papers. This certainly offers much better conditions and if properly used should produce an intellectually stimulating environment.

Aside from the Command and Staff Course that is part of "Advanced Officer Professional Development," the Canadian Forces College also offers two courses under the category "Colonel and General Officer Professional Development." The Advanced Military Studies Course (AMSC) focuses on command issues at the operational level while the National Security Studies Course covers development, management and implementation of Canadian defence and security policy. Each course has a number of "learning outcomes." For example, some of the learning outcomes for the AMSC

include: resolving "complex issues and problems using critical thinking, analysis and synthesis;" demonstrate a commitment to continue their personal and professional self-development in an informed manner; and perhaps an intentional or accidental acknowledgement of Clausewitz, to "make sound and timely decisions, even in conditions of imperfect information." A similar thrust exists in the National Security Studies course, which has as one of its learning outcomes "Develop and articulate organizational strategic vision; develop adaptive future-oriented structures and processes."¹¹ Interviews with students from a number of courses, each with varied exposure to academic studies, have consistently noted the intellectual challenges of both courses, and in particular the AMSC. Not surprisingly, graduates of the War Studies Programme or similar courses find the academic portion of both courses more manageable.

Given the strategic demands on the Canadian Forces outlined at the beginning of this paper, the need for developed intellectual capabilities is greater. Officers will need to process more information in a shorter time while the demand for correct decisions increases. As officers progress, their warfighting and other skills will need to be balanced with education. While the academic environment itself is not perfect, it offers the best place to do so. The developmental model being applied across the Canadian Forces offers a mix of training and education. Higher-level military training now includes an academic component.

The Canadian Forces is moving into a period where it must deal with its own strategic issues and develop a warfighting doctrine. The demands of this new operational environment and the global projection of force to defend Canadian interests (however we may define those) are some things we have

not faced since forces were permanently stationed overseas in the early 1950s. This strategy must be forged within the limitations of budgetary restrictions, policy gaps, changing views of the military, personnel retention and career development. There is a greater need than ever to have a professional officer's corps and one that can think. While education is not the panacea, it is a keystone to achieving this. Intellectual development must begin early in one's career and be developed as the officer moves from tactical to operational and possibly strategic responsibilities. Given directed career management, perhaps in a few years, we will have an officer corps completely unrecognizable from that which we now have.



ENDNOTES

1. Douglas Bland. *Chiefs of Defence: Government and the Unified Command of the Canadian Armed Forces*. Toronto, Canadian Institute of International Affairs, 1995, p. 29.
2. Major Bill Beaudoin, "On an Educated Officers Corps," in the *Army Doctrine and Training Bulletin*, Volume 3, No. 3, Fall 2000, pp. 54 – 55.
3. *Training Canada's Army, Draft 2*, 22 August 2000 (B-GL-300-008/FP-001), p. 1
4. *Training Canada's Army*, pp. 18-19.
5. Master-Corporal Richard P. Thorne, "An Analysis of Strategic Leadership" in the *Army Doctrine and Training Bulletin*, Volume 3, No. 3, Fall 2000, pp. 8-15.
6. Since the presentation of this paper, two noteworthy books have come forward that have substantially increased Canadian literature on this subject. See, *Warrior Chiefs: Perspectives on Senior Canadian Military Leaders*, Edited by Lieutenant-Colonel Bernd Horn, Ph.D. and Dr Stephen Harris, Toronto, Dundurn Press, 2001; and *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership*, also edited by Lieutenant-Colonel Bernd Horn, Ph.D. and Dr Stephen Harris, St Catharines, Vanwell Publications, 2001.
7. *Training Canada's Army*, pp. 21-23.
8. Clausewitz, *On War*, p. 100.
9. Clausewitz, *On War*, p. 102.
10. *Ibid.*, p. 102.
11. See the Canadian Forces College website at <http://www.cfc.dnd.ca/DP4/dp4.en.html>.

This issue of the *Army Doctrine and Training Bulletin* (ADTB) ends the collaborative relationship between the ADTB and the Canadian Forces Training Materiel Production Centre, or CFTMPC, based in Winnipeg. CFTMPC provided graphic design, layout, editing, translation, proof-reading, printing and distribution services and with the reorganization of CFRETS, it is being disbanded, resulting in the loss of this capability to the CF. The staff of the ADTB offer their thanks to the project managers, editors, graphic artists and other personnel of the CFTMPC for the continued dedication, responsiveness and professionalism, which has enhanced the quality of this professional journal. Best of luck.

CFTMPC CPMIFC

The Canadian Battle of Normandy Foundation announces: The 9th Annual Battlefield Study Tour

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**A Two-Week Study Tour of Canadian Battlefields in Sicily and France
25 May to 15 June 2003**

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**LGen Charles Belzile, President,
Canadian Battle of Normandy Foundation**

Canadian Land Force Command and Staff College and the Conduct of Army Officer Developmental Period 2

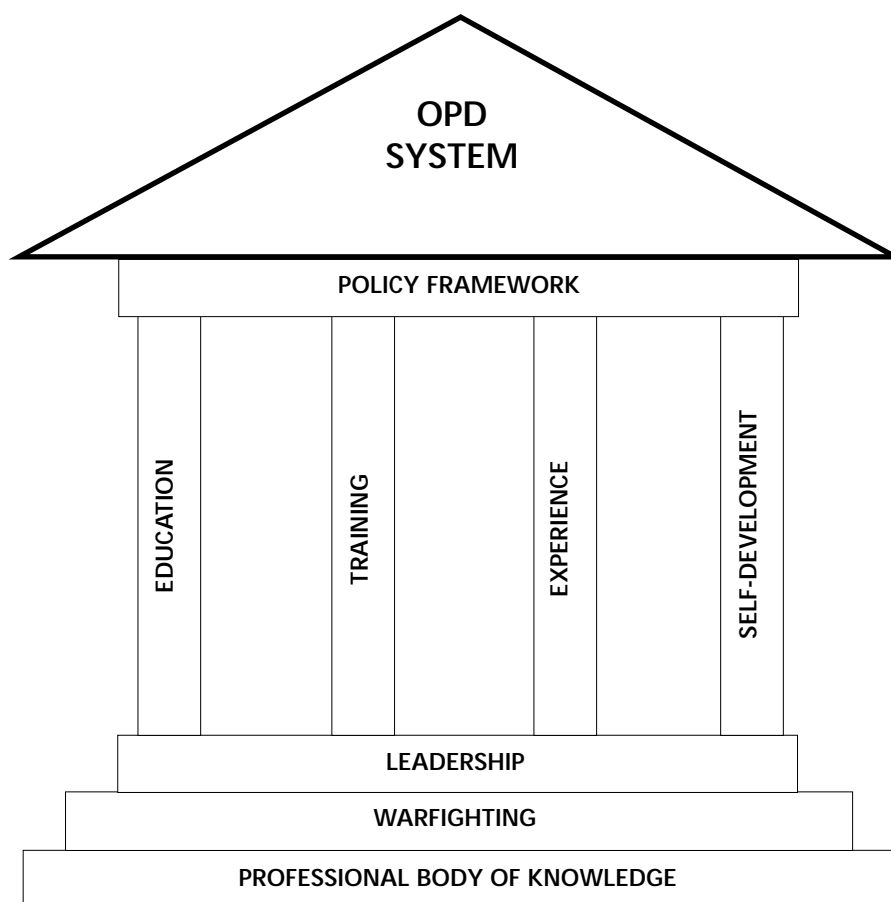
BACKGROUND

In order to ensure that the officer corps remains capable of operating in today's complex world, officer education and training is being enhanced and reformed throughout the Canadian Forces. In accordance with the Officer Professional Development (OPD) System and a review of the Officer General Specification (OGS), fundamental changes are underway in the conduct of training at the Canadian Land Force Command and Staff College (CLFCSC).

The OPD system is based on four pillars: education, training, employment experience, and self-development. Its aim is to ensure that leaders receive their professional education and development when they need it in order to optimize their effectiveness and career potential. When combined with the principles of universality, training to need, and just-in-time training, the OPD system will ensure that each officer is provided with the required knowledge and skills, consistent with rank, in a timely and efficient manner.

As a vital step in the reform process, CLFCSC, as directed by the Chief of the Land Staff (CLS) and Commander Land Force Doctrine and Training System (LFDTS), has implemented a complete revision of its programme. In a fundamental shift toward universality of officer training, training at the Staff College will now be open to all army captains. The desired end-state is the provision of staff training to all army officers while enhancing quality of life by minimizing the time away from home and garrison.

Universality is not being pursued simply for altruistic reasons. In fact, the



exact opposite is the case. The current and forecasted operational tempo, combined with the reduced size of the Army's officer corps, means that the Army can no longer afford to have officers who are not fully employable across the broadest spectrum of staff appointments. It should also be noted that the Army provides 66% of the staff officers employed by the CF. The Army and, indeed, the CF as a whole, rely heavily upon the continued development of highly skilled army staff officers. The upshot is that to maintain essential levels of flexibility and operational effectiveness, all general service officers must be capable of filling general staff positions in units, formations, and alliance and coalition

headquarters. Thus, CLFCSC seeks to maintain its high quality of training, while increasing accessibility.

OGS AND OFFICER DEVELOPMENT

The OGS specifies four developmental periods (DPs), which define the career development of officers. DP 1 corresponds to basic training as an officer cadet. DP 2 covers the period from MOC qualification until promotion to the rank of major. DP 3 starts with promotion to major, ends with promotion to colonel, and incorporates operational level army and joint training. Finally, DP 4 covers officers at the rank of colonel and general officers.

Army Officer DP 2 training will cover all common and land environmental requirements that are listed in the OGS at the DP 2 level for which formal training or education is required. The DP 2 programme will be delivered in four phases: Phase 1, Preliminary Studies; Phase 2, Distributed Learning (DL); Phase 3, Residential Training; and Phase 4, Post-Residential Training. The Army Operations Course (AOC) consists of elements of Phase 1 and Phases 2 and 3. Its objective is to educate and develop the ability to perform the duties of staff at unit and brigade group levels. Its stated aim is to develop in junior officers the essential knowledge and skills needed to function effectively at the tactical level of operations.

CLFCSC is not the only institution providing DP 2 level training. The Combat Training Centre plus corps and branch schools will deliver DP 2 occupational training. Some officers will also be required to complete second language training. Army DP 2 officer education also includes the requirement to complete the Officer Professional Military Education Programme (OPME), managed by The Royal Military College of Canada (RMC). A total of six OPME courses must be completed before the officer can progress to DP 3. Officers are encouraged to complete these courses as early as possible, and two courses, "Leadership and Ethics" and "Science and War: The Impact of Military Technology," are prerequisites for AOC Phase 2 (DL). The AOC relies upon these two courses for foundation knowledge for related material covered on the course. OPME courses not completed during the preliminary studies phase must be completed during the post-residential phase and are prerequisites for attendance on the Canadian Forces Command and Staff Course (CFCSC).

The AOC differs from previous courses delivered by CLFCSC in that it will be conducted in accordance with a course training plan (TP) derived from the Army DP 2 Officer Qualification Standard (QS), which in turn has its origin in the Common Performance Requirements and Land Environment

Performance Requirements of the OGS. The AOC curriculum is delivered in the form of 15 performance objectives (POs) and 10 education objectives (Ed Os). A full breakdown of these is available on the CLFCSC web site.

Officers may begin work on DP 2 material as soon as they have completed DP 1, and the AOC DL and residential components will be open to all Army captains. In accordance with the revised OGS, it is intended that all army officers receive this course; however, those captains not under the "Managing Authority" of the Army will undergo the Canadian Forces Staff and Operations Course. Eligible occupations include Training Development, Chaplain, Personnel Selection, Public Affairs, Medical, Dental, Music and Legal. Even in this case, some officers may take the AOC due to upcoming appointments in field units, e.g., a medical officer due for employment in a Field Ambulance.

While intended principally for general service army officers, the AOC will also be offered to selected officers from the other environments and other nations. For example, pilots who will follow a career through tactical aviation units will be invited to attend the course. As officers progress to DP 3, they then become eligible for sub-unit command and staff appointments in the rank of major at brigade, army or national levels. The AOC is, therefore, a key element in the development of not only army officers, but the Army as a whole.

KEY ASPECTS OF THE AOC

The AOC will replace the Intermediate Tactics Course (ITC) and the Transition Command and Staff Course (TCSC), with the pilot DL tutorial beginning in August 2003. The AOC utilizes a variety of instructional methodologies, including self-study, unit controlled training, DL and residency at CLFCSC. This article describes the conduct of the AOC, with particular emphasis on the unique role that unit COs must play in DP 2 training. It also serves to amplify and update the article written by the Commandant CLFCSC, which appeared in the Spring 2002 edition of *The Army Doctrine and Training Bulletin* (ADTB).

As previously indicated, the AOC will cover 15 POs and 10 Ed Os. The POs describe tasks that will be performed on the job, the conditions under which they will be performed, and the required standard of performance, whereas the Ed Os describe knowledge that supports performance but is not limited to a specific task or set of tasks. For example, Ed O 205, "The officer will explain the types of orders and their use" describes knowledge that supports, but is not limited to, PO 203, "The officer shall plan tactical missions within the context of a battle group and a brigade group." Both POs and Ed Os were derived from the OGS and were developed by the Army DP 2 Officer Qualification Standard Writing Board (QSWB) using the process of task analysis.

POs and Ed Os are further broken down into enabling objectives (EOs), covering specific subjects. In the case of the above example, PO 203 consists of six EOs: Battle Procedure, The Estimate, Staff Checks, The Operation Planning Process, Risk Analysis, and Preparation of Operational Orders. Similarly, Ed O 205 includes three EOs: Operational Staff Duties; The Usage, Content and Format of Orders; and The Conduct of an Orders Group. EOs, in turn, consist of teaching points, which form the basis of specific lessons.

With the fielding of the Land Force Command and Control Information System (LFC²IS), the Army is rapidly becoming a digitized force. During the DL phase of the AOC, officers will be introduced to the Athene Tactical System (ATS) and the Operational Planning Environment and Reference Application (OPERA) in a programmed study package. During the residential phase of the course, the officer will be trained in the tactics, techniques and procedures, which support a digitized decision-action cycle. This training will be further developed in a series of digitized exercises at the battle group, brigade and task force levels. Consequently, graduates of the course will be qualified to operate "digitally" within a unit and brigade headquarters.

Self-study, DL and professional development training are not new. Many currently serving officers will have completed the Officer Pro-

Professional Development Programme (OPDP), FMC Officers Exams (FOE), Intermediate Officers Course (IOC) and/or Parts 1 and 2 of the ITC. Approximately the same amount of self-study will be required to complete the DP 2 programme as these earlier programmes. However, because CLFCSC will be synchronizing all components of the DP 2 programme, much better coordination should be possible, both in relation to the professional development requirements of individuals, and the overall Army Training and Operations Framework (ATOF).

CONDUCT OF THE DP 2 PROGRAMME

The four phases of the DP 2 programme (Preliminary Studies, DL, Residential, and Post-Residential), which embrace the four pillars of the OPD system (self-development, education, training and experience), are described as follows:

Phase 1 – Preliminary Studies (Self-Development and Experience Pillars)

Phase 1 consists of three elements:

Office Professional Military Education. Officers must complete two OPME subjects through a self-study programme administered by RMC. It should be noted that RMC graduates will receive some OPME credits by virtue of their completion of the RMC core curriculum. Similar conditions may apply to graduates of civilian universities who can submit requests for OPME equivalencies to the RMC Prior Learning Assessment and Recognition (PLAR) Office. All other officers must register for the OPME through RMC and complete the OPME Programme on their own time. The following OPME subjects must be completed before the officer can proceed to AOC Phase 2 (DL), and it is recommended that junior officers complete these OPMEs during their first unit tours:

- Leadership and Ethics (10 weeks, part-time study), and
- Science and War, The Impact of Military Technology (15 weeks, part-time study).

While officers are required to complete only these two OPMEs prior to attempting AOC Phase 2, they are strongly encouraged to complete the OPME package as soon as possible; otherwise, they could be delayed in attending CFC following completion of the AOC residential phase. The remaining four OPME courses are:

- Introduction to Defence Management (10 weeks, part-time study);
- Introduction to Military Law (9 weeks, part-time study);
- The CF and Modern Society: Civics, Politics and International Relations (13 weeks, part-time study); and
- War and Military History (16 weeks, part-time study).

Unit-Managed Curriculum. This part of the programme, also presented on the World Wide Web, emphasizes the self-development and experience pillars and consists of three modules. The material, including basic guidance and directing staff (DS) notes, will be provided and updated through CLFCSC. This part of the programme is intended to provide a framework and standard for the conduct of officer training already done at the unit level. Additionally, CLFCSC will provide tools to assist commanding officers in the conduct of unit run PD training such as the estimate process and tactical exercises without troops (TEWTs). The following DP 2 subjects will be covered in this component:

- Ed O 207 - Creative Thinking and Communication Skills. The officer will follow a series of self-paced computer-based study packages designed to develop his problem solving and written communication skills. The officer will then prepare a written brief, in accordance with a provided scenario, and a service paper on a topic assigned by the unit CO. Both the brief and the service paper assignments will be mentored and graded by the CO or his designate. In the case of briefs or service papers assessed as failures, unit COs will have the

discretion to assign re-write topics (42 hours of self-study/unit-directed activity).

- PO 212 - Chair a Meeting. Units will be provided with a package designed by the CF Management Development School, which will guide the officer through the planning, coordination and conduct of a meeting on a subject assigned by the CO. The officer will also be responsible for producing the minutes of the meeting and following up on any post-meeting activities (16 hours of self-study/unit-directed activity). A guide offering a variety of methods of delivering this package will soon be made available to unit COs.
- PO 214 - Supervise Unit Physical Fitness Training. Units will be provided with a package designed by the CF Personnel Support Agency, which will guide the officer through the preparation of a platoon/troop level fitness plan in accordance with the Army Fitness Programme. The officer will then supervise the execution of this plan (35 hours of self-study/unit-directed activity).

Note: The Staff College will be staffing a request in the near future to conduct trials of these Ed O/POs with selected field force units to ensure the validity of the packages.

CLFCSC-Managed Curriculum. This portion of the course consists of a two web-based, self-paced study modules. These modules culminate with computer-based testing, and the officer must successfully complete each module in order to be eligible for progression to Phase 2 of the AOC. Officers will complete these modules on their own time, and it is recommended that these are completed as soon as practical within a young officer's career. The following material will be covered:

- Ed O 203 - Friendly and Enemy Force Organizational Structures. This module describes the Canadian Main Contingency Force (MCF) Brigade Group, which is now the basic tactical formation-level structure for the Land Force. This programme of study also features

a revised and more realistic opposing force (OPFOR) that marks a significant departure from the previous enemy force construct used by the College, which was based primarily on outdated Warsaw Pact organizations and doctrine (59 self-study hours).

- **Ed O 206 - Impact of Technology on Land Operations.** This module provides the officer with an understanding of current and emerging technologies on the battlespace of today and tomorrow. Furthermore, an explanation of the six combat functions is given to include a description of how the combat functions are integrated to create combat power (68 self-study hours).

Phase 2 – AOC DL (Education Pillar)

Once officers have completed Phase 1 of the DP 2 Programme, they will be loaded on Phase 2 by their career managers in consultation with their respective branch/regiment advisors. Timing will depend on MOC career profiles, job selection, corps/branch requirements and a unit's place in the ATOF. During Phase 2, officers will follow a structured duty-time DL course of approximately seven weeks at their home garrison location. Some amendments to both the preliminary studies and DL phases are being considered at this time, which may result in a minor adjustment to the length of this phase. The DL package will be delivered using a system similar to Web Course Tools (Web CT), which is currently being used on the TCSC and by RMC. This phase of the AOC will introduce officers to a variety of innovative and modern educational techniques such as computer-based learning, virtual syndicate discussions, and video-conferencing. Evaluation will consist of a combination of computer-based testing, informal written e-mail submissions, formal written products, participation in on-line discussions, and subjective evaluation of individual participation in syndicate or other activities.

During the DL portion of the course, officers will study combat power and relate the six combat functions to the application of army doctrine for all phases and operations of war and

operations other than war (OOTW). Officers will also cover leadership theory and the Army ethos and begin to develop their understanding of staff processes. The DL phase will conclude with two self-paced computer-based learning modules on the ATS and OPERA. A solid understanding of both applications is essential prior to the officer's formal LFC2IS training during the residential phase of the AOC.

Unlike the TCSC, which has a staff-administered DL final exam, the AOC will rely on computer-based tests for individual POs and Ed Os. Tests will be marked automatically and students advised immediately of their results. All tests must be passed before proceeding to the residential phase, and remedial training and retests will be programmed, if required.

The Ed Os and POs covered on the DL phase are:

- Ed O 201 – Leadership Theory (including elements of PO 201 – Leadership Practice),
- Ed O 202 – Army Doctrine;
- Ed O 203 – OPFOR Review;
- Ed O 204 – Combat Power;
- Ed O 205 – Orders;
- Ed O 210 – Army Ethos (continued in residential phase);
- PO 202 – Duties of a Staff Officer (ATS and OPERA computer-based training modules);
- PO 203 – Plan Tactical Missions (continued in residential phase); and
- PO 213 – Individual and Collective Training Design.

Phase 3 – AOC Residential (Education, Training and Experience Pillars)

Phase 3 consists of a 12-week residency at Fort Frontenac, Kingston. This phase of the course will be a progressive series of lectures, discussions, TEWTs, and command post and com-

puter-assisted exercises at the battle group and brigade group levels. Officers will be expected to demonstrate proficiency with the estimate and operation planning process (OPP) and to function effectively as members of a battle group or brigade group staff executing operations in all phases and operations of war, as well as OOTW. Officers will also build upon the theoretical aspects of leadership, introduced in Phase 2, and acquire the ability to plan and conduct individual and collective training. This is obviously the most intensive part of the course and provides ample opportunity for subjective and objective evaluation of the officer's knowledge, leadership ability and staff potential. Specific Ed Os and POs covered during the residential phase include the following:

- Ed O 210 – Army Ethos (continued from DL);
- PO 201 – Leadership Practice (continued from DL);
- PO 202 – Duties of a Staff Officer (practical application);
- PO 203 – Plan Tactical Missions (practical application);
- POs 204 to 207 – Conduct Offensive, Defensive, Delay and Transition Operations;
- PO 208 – Operations Other Than War;
- PO 210 – Deliver Oral Presentations;
- PO 211 – Respond to Media Questions; and
- PO 213 – Prepare a Unit Training Plan.

Phase 4 – Post-Residential (Self-Development Pillar)

The final phase of DP 2 returns to the self-study format and must be completed before officers can attend the CFCSC in Toronto. It includes two distinct elements, as follows:

CLFCSC-Managed Curriculum. This aspect of the programme consists of three web-based, self-paced study

modules available to all AOC graduates on the World Wide Web. These modules include the following:

- Ed O 208 – Joint and Combined Operations. This Ed O will provide an overview of joint and combined doctrine, plans and operations as well as the types and characteristics of air, land and sea weapons (eight hours of self-study). This package will serve as a bridge between the tactical level of war studied in DP 2 and the operational level of war, which forms the basis of the DP 3 curriculum.
- Ed O 209 – Develop Strategic Thought. This Ed O deals with the mission, roles and vision for the Army, the hierarchy of defence plans, international crisis prevention and management, and finally, Canada's national readiness posture (21 hours of self-study).
- PO 215 – Financial Resources. This self-paced package is designed to guide officers through the process of obtaining and managing financial resources and to describe miscellaneous requirements procedures (45 hours of self-study).

OPME. Officers will be required to complete any OPME courses that they did not complete during Phase 1 before advancing from DP 2 to DP 3.

All army officers must complete all four phases of the DP 2 training profile. However, selected officers may be offered an abbreviated residential phase. Officers in MOCs that do not operate at the tactical level and officers who have extensive prior training or experience may be offered a special residential phase (SRP) in lieu of the full 12-week residential phase. This three-week long serial will cover all of the key elements of the standard residential phase, but exercise activity will be significantly reduced and LFC²IS eliminated. SRP graduates will be considered eligible for promotion, attendance at CFC and command appointments. It is anticipated that officers from the following groups may be considered for SRP selection :

- officers commissioned under the Commissioned from the Ranks (CFR), Special Commissioning Plan (SCP) and University Training Plan (Non-Commissioned Members) (UTP NCM);
- component transfer captains and majors;
- officers who have previously completed the Air Force or Navy DP 2 programmes;
- officers who have completed equivalent foreign staff training;
- officers with extensive staff or liaison experience in a formation, joint, foreign, alliance or coalition HQ; and
- officers from occupations and occupational specialties that do not require tactical level training.

This list will be confirmed by the Director of Army Training (DAT) in consultation with the Director Land Personnel (DLP).

SRP selection will not be automatic simply because an officer is in one or more of the above categories. Candidates for this course will be determined through a separate selection process, which will be confirmed by DLP. Those identified to attend the SRP will be notified in the same manner that AOC selection is announced.

The TCSC will end when the AOC is approved. Future curriculum development will also see the Militia Command and Staff Course (MCSC) aligned with the AOC. As well, work continues to ensure a seamless transition between the AOC and DP 3 courses at CFCSC.

WAIVERS AND EQUIVALENCIES

Officers who previously completed the Canadian Land Forces Staff Course (CLFSC), the Land Force Staff Course (LFSC) and the Land Force Command and Staff Course (LFCSC) or the TCSC are fully staff qualified and do not need to complete any portion of the DP 2 Programme, except for LFSC graduates as noted below. All those

qualified from previous courses are encouraged to complete Phase 4 – Post-Residential because this component contains a significant amount of new material, which will be useful for future development. On 9 July 2002, the Army Professional Development Senior Review Board (PD SRB) decided that army officers who completed the LFSC, but did not attend the LFCSC or TCSC, would be considered for exemption from the AOC. To provide proper evaluation, however, these officers will attend the TCSC Exercise FINAL DRIVE in a tested student capacity. These students will receive a course report based on their report from the LFSC and their assessment from Exercise FINAL DRIVE. This decision was arrived at because there is significant curriculum duplication between the LFSC and the TCSC, and the performance of LFSC students on the TCSC has been consistently very high. This opportunity will end, however, with the start of the AOC because that course has an entirely new curriculum, and the lack of LFC²IS training will prevent LFSC graduates from participating fully in the AOC final exercise.

The Directorate of Army Training (DAT) remains responsible for managing all other equivalencies and, in consultation with the Deputy Commandant CLFCSC, will assess foreign courses using the AOC POs and Ed Os as a guide to determine if a provisional equivalency should be granted.

The College readily acknowledges the fact that officers selected for the AOC pilot serials (defined as AOC 01, 02, 03 and AOC SRP 01) will have a limited amount of time in which to complete the Preliminary Studies Phase, including the prerequisite OPME subjects. In order to provide a degree of flexibility for those officers attending the pilot serials, officers will be required to complete any two OPMEs and not strictly the Leadership and Ethics and Military Technology subjects. Officers may also receive credit for AOC related material covered on the Intermediate Tactics Course (ITC). With these objectives in mind, CLFCSC has made the following recommendations to the Commander LFDTS and is awaiting a final decision

during the December 2002 session of the Professional Development Senior Review Board:

- Officers attending the AOC pilot serials may be exempted from completing the unit directed curriculum of Ed O 207 - Communication Skills (less the two creative thinking self-study packages), PO 212 - Chair a Meeting, and PO 214 - Supervise Army Physical Fitness Training.
- Graduates of the ITC may receive a waiver for Ed O 204 - Combat Power and Ed O 205 - Orders.

Note: Graduates of the Land Force Technical Staff Course will receive a waiver for Ed O 206 - Impact of Technology on Land Operations.

SELECTION CRITERIA

Steady State selection criteria for the AOC are under development and will be promulgated by DLP in consultation with the Director Army Training (DAT), the career managers and the branch/regimental advisors. Steady state will not be reached, however, until 2007, when the first officers enrolled and completely trained under the new OGS and Land Environmental Performance Requirements reach the AOC three-year window. Until then, the following transitional selection criteria apply:

- officers selected to attend CFCSC the following year;
- captains to be promoted during the current year;
- captains likely to be promoted during the following year; and
- officers filling or selected for appointments requiring staff training (unit Ops O, Adj, Bde G3 Ops, G3 Plans, etc.)

COURSE DATES

All DP 2 Preliminary Studies materials will be available on the World Wide Web beginning in November 2002. The first AOC serial has been postponed from the spring to

the late summer of 2003 to allow students more time to complete the preliminary studies. In 2004, and subsequent years, two AOCs will be run in the January to June period and one every fall. DL for SRPs will run every spring and the residential component will run in August-September each year. The latest dates for all courses until the end of 2004 can be found on the CLFCSC web page. Currently programmed course dates are as follows:

COURSE	DL	RESIDENTIAL
TCSC 07	12 Nov - 18 Dec 02	13 Jan - 21 Mar 03
TCSC 08	10 Mar - 17 Apr 03	22 Apr - 27 Jun 03
AOC 01 (Pilot Course)	11 Aug - 26 Sep 03	29 Sep - 19 Dec 03
AOC 02	3 Nov - 19 Dec 03	5 Jan - 26 Mar 04
AOC 03	16 Feb - 2 Apr 04	5 Apr - 25 Jun 04
SRP 01 (Pilot Course)	10 May - 25 Jun 04	23 Aug - 10 Sep 04
AOC 04	9 Aug - 24 Sep 04	27 Sep - 17 Dec 04

PERSONNEL MANAGEMENT

AOC and SRP course reports will cover all curriculum covered on Phases 1 to 3. They will not cover the OPME Programme, which will be assessed and reported upon by RMC, or material covered during Phase 4, which will be reported upon separately. Grading of individual POs and EdOs will be in accordance with the TP and the grading scale is being adjusted from that used on previous CLFCSC courses to bring it in line with Army and CF norms: A - Demonstrates Exceptional Ability; B - Demonstrates Ability; C - Meets Minimum Standard; and F - Fails to Meet the Standard. The means of establishing overall course grades and ranking graduates are being evaluated and will be confirmed prior to the pilot course.

A personnel record update system to monitor programme progress is also being developed to track the progress of officers through DP 2. Details will follow. This system will allow COs to set out DP 2 training objectives in Performance Development Reviews (PDRs), and track and monitor them as an integral part of the Canadian Forces Personnel Appraisal System (CFPAS).

PRODUCTION CHALLENGES

Two serious production challenges will confront the College over the next few years: providing training for those officers who will just be entering DP 2 and meeting the requirements of those officers who were not previously selected for training. The Army's strategy for ensuring that all officers that require training receive it, is summarized as follows:

- CLFCSC capacity will be based upon the production requirement when the new training system reaches maturity - post 2007. This production requirement is currently assessed by DLP to be approximately 250 Canadian army officers per year.
- Between now and 2007, CLFCSC will use its end-state production capacity to first train those officers with an immediate operational, employment or professional development reason for staff training, then officers with a transitional requirement. The College has considerable capacity to address the dual challenges because the number of officers entering the DP 2 window during these years will be significantly less than the College's total production capacity. It can train on average an estimated 100 officers per year in addition to those officers with immediate needs.

Consistent with this approach, the 9 July 2002 PD SRB decided that, henceforth, majors would not attend the TCSC or AOC unless they are selected to attend CFC. This decision

will allow almost 100 officers to attend CLFCSC over the next two years who otherwise would have been delayed or denied the opportunity. It is important to note that this is only a short-term provision. Given the AOC selection criteria and that by 2007 sufficient capacity will exist to provide all captains who reach the three-year DP 2 window with the required training, the untrained major phenomenon will progressively disappear over the next few years.

To address the transitional training requirement, the College will increase production significantly beginning in 2003. In 2002, CLFCSC will graduate 144 students on two TCSCs. In 2003 this will increase to 216 officers on two TCSCs and the first AOC. In 2004 this will increase even further to 288 officers on three AOCs and an SRP. This production rate will continue until all those requiring and willing to undertake training receive it. It is anticipated that this will occur no later than 2006. It is worthy to note that prior to 1995, CLFCSC graduated only 120 students per year, and that when the LFSC and LFCSC were being run, only 72 students per year graduated ready to attend CFC. 2004 production will quadruple this figure!

In order to increase AOC production in 2007 and beyond, the College is also investigating increasing

the number of syndicates per course from the current six to seven, resulting in an additional 36 vacancies per year. However, the move to seven syndicates would generate a very considerable resource bill: additional quarters, classrooms, information systems support and, most critically, directing staff and support personnel would be required. A decision on whether to proceed with this investment will be made by 2005, when we will have a much better understanding of the production requirement in 2007 and beyond. The decision will be based in large part on the predicted student load: if the additional capacity is required, it will be built; if not, it won't.

CONCLUSION

The Army DP 2 Officer Training Programme is the most thoroughly planned and coordinated officer training programme ever conducted by CLFCSC. Based on an exhaustive OGS and Land Environmental Performance Requirements analysis, and synchronized with the Canadian Forces OPME, it provides the essential bridge between entry level DP 1 training and DP 3 training for senior officers. Moreover, its use of a broad spectrum of delivery methodologies during self-study, DL and residential training ensures that officers will receive the best training ever delivered by CLFCSC, and in the most timely manner. Based on the four

pillars of education, training, experience, and self-development, it will require the active involvement of officers, their COs and CLFCSC.

CLFCSC has an enviable reputation of training highly professional staff officers who are fully capable of filling demanding staff appointments in national and international headquarters. The College continues to build upon the experience gained from the TCSC in the delivery of DL and is exploring a variety of new technologies and techniques to present curriculum in the most effective way possible. The AOC, as the centrepiece of the Army DP 2 Officer programme, will be the best-designed course that the College has ever delivered.

Comments or questions regarding the AOC may be forwarded to the CLFCSC Chief Standards Officer, Lieutenant-Colonel Dennis Hartnett, at 613-541-5010, ext 5865, or e-mail at Hartnett.DG@forces.ca.



From the Directorate of Army Training

A Systems Approach to Training to Need

by Captain Dale E.O. LaFrenière

The term “training to need” is often misunderstood as the Army adjusts its approach to training. Most significantly, there is a perception held by many that training to need implies reducing training simply to reduce budget and resource expenditures. This is not the case. Although greater control over monetary resources is necessary during fiscal restraint, changing the way the Army trains is not solely a cost-saving endeavour. In the past few years it has become apparent that the training system no longer satisfies Canada’s defence requirements, and that a great deal of inefficiency exists within the system. The CF’s, and by extension the Army’s, new professional development (PD) system is an attempt to correct these problems through a systemic approach to training. This approach is designed to make the training system more efficient and effective. To this end, the Army initiated a process to determine exactly what was required of the training system, so that the Army could achieve its strategic requirements.

To meet its strategic requirements the Army must ensure that it is training individually and collectively in the correct areas, at the correct level, at the correct time. In order to do this, we must “Train to Need.” However, it becomes somewhat dogmatic to simply toss this phrase about without truly defining what “Training to Need” means.

Training Canada’s Army (B-GL-300-008 / FP-001), which details the Army Systems Approach to Training (ASAT), defines “Train to Need” as containing three key concepts: Resources Must Follow Tasks, Training Must Facilitate Learning, and Training Must be Confirmed.¹ Train to need itself came about because of the realization that the Army “cannot afford to have

every unit simultaneously attempting to train to the highest level of operational readiness.”² The Army must prioritize its training and align its training resources, often disproportionately, in order to meet its operational requirements. Hence, the essence of “Training to Need.”

The definition of need is based first on operational requirements or tasks, as directed by the government through DND. Next, it is based on resources allotted, as detailed in the Strategic Operational Resource Directive (SORD), which contains the Army Training and Task Table. The Army Training and Task Table essentially gives the Army its “marching orders,” by setting the assigned training level for each departmental Defence Plan Task.³ The ‘marching orders’ come in the form of a series of Battle Task Standards (BTS). Based on Army doctrine, BTS are a quantification of the level of expertise required to perform a given battle task. The BTS establishes the scale and nature of formation and unit collective training, and represent the distillation of doctrine and the pro-

vision of a framework or guidelines for an approach to collective training. All of this leads to the training development process.

There are in fact two training systems, an individual training system and a collective training system. It is the former that is the focus of this article, for it is the individual training system that deals with the professional development (PD) of officers and soldiers. Individual training sees every member trained for the tasks they are expected to be capable of performing. PD is a systemic, career-long process, which incorporates a number of processes to ultimately transform a Canadian citizen into a military professional, proficient at the performance of expected tasks.⁴ The PD system is a “highly integrated [process] that encompasses the full development of individuals to meet, first, the general requirements of membership in the CF, second, the specific requirements of employment in the land environment, and finally, unique requirements of specific military occupational structures (MOCs).”⁵

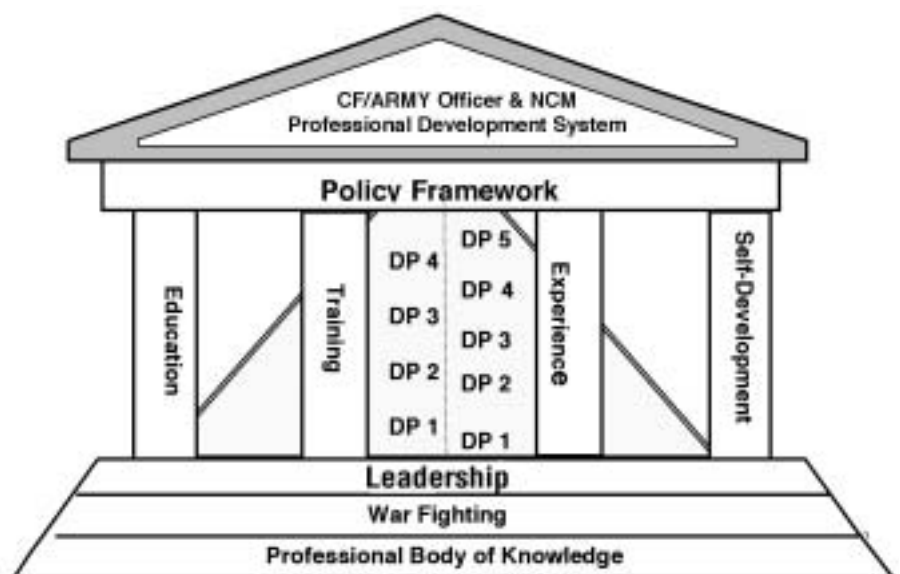


Figure 1

The model for PD is based on four pillars: Education, Training, Experience and Self-Development, as detailed in Figure 1.⁶ A career in the CF is laid out in developmental periods (DPs). The associated ranks for each DP are detailed in Figure 2.⁷ It is between training and experience that the DP model is located. The DP model is primarily based on training and experience. However, it does contain elements of Education and Self-Development, and therefore draws on all four pillars to some extent, in order to provide officers or soldiers with the required skills to perform their jobs.

That being said, a systemic approach to training development is needed to ensure that personnel are trained in the necessary skills to perform their jobs, while not being overburdened by the individual training system. This system is the training development process. The process itself is based upon a five-year cycle of analysis, design, development, conduct, evaluation and validations (Figure 3).⁸ The first step is an occupational analysis (OA). The OA is a "process of conducting a detailed objective examination of an occupation or group of occupations. It is the determination of the job performance requirements and relationship of jobs being performed." An OA also includes integrating known future requirements, which arise because of policies, plans, procedures, equipment and Technology.⁹

The OA is conducted in four phases. Phase 1 is the preparation phase. Its purpose is to lay the groundwork for the OA study, which includes pre-study and planning activities for the framework of the OA.

DP	OFFICERS	NCMs
1	Officer cadets (in some cases 2nd lieutenants)	Private (recruit) and private (basic)
2	2nd lieutenants, lieutenants and captains	Private (trained), corporals
3	Majors (DP 3A), lieutenant-colonels (DP 3B)	Master corporals, sergeants
4	Colonels, general officers	Warrant officers, master warrant officers
5	N/A	Chief warrant officers

Figure 2

The second phase is the occupational survey phase, during which, personnel in the military occupational classification (MOC) under analysis are observed, interviewed and complete a series of questionnaires. The purpose of this phase is to get objective feedback from personnel to determine just what jobs and activities are carried out within the MOC. It is a personnel driven approach to determining just how an MOC functions. The third phase is the actual analysis phase. It is during this phase that all the raw data is analysed and processed into relevant information for the completion of the fourth and final phase. It is during this phase that a final report containing the board findings and recommendations for MOC structure is drafted and submitted.¹⁰ All of this leads to the next step in the training development process, the production of Occupational Specifications.

The recommendations in the OA are then taken by the Directorate of Military Human Resource Requirements (DMHRR), who then produces, as part of the Military Occupational Structure (MOS), Occupational Specifications (OS) on the MOC. The OS describe the common tasks and knowledge required by an individual to function within their MOC. The Army has four levels of MOS: General Specifications (GS), which come from the CF, Land Environmental



Figure 3

Specifications (LES) (specific to the Army), and the OS and Occupational Specialty Specifications (OSS). The GS describes what all members of the CF are required to do. The LES amplifies the GS by describing the additional requirements that all soldiers are required to do. The OS describes what all personnel employed in a specific MOC must do and finally the OSS describes specialized requirements of a sub-section of that MOC.

A key difference with the OS recently adopted by the CF and the Army is that they are "job based," and consequently the OS are often referred to as Job-Based Occupational Specifications. This means that selection and training is based on employment rather than rank, as it was in the past. Additionally, promotion is based upon selection for employment rather than completion of individual training. Individuals will be identified for employment and either promoted and sent on the required training or sent on the required training then promoted upon completion as part of assuming their new job.

The OS specify the jobs within the MOC and detail the specific tasks required of that job and the knowledge required to complete those tasks. It is an analysis of those tasks and knowledge that lead to the actual development of training.

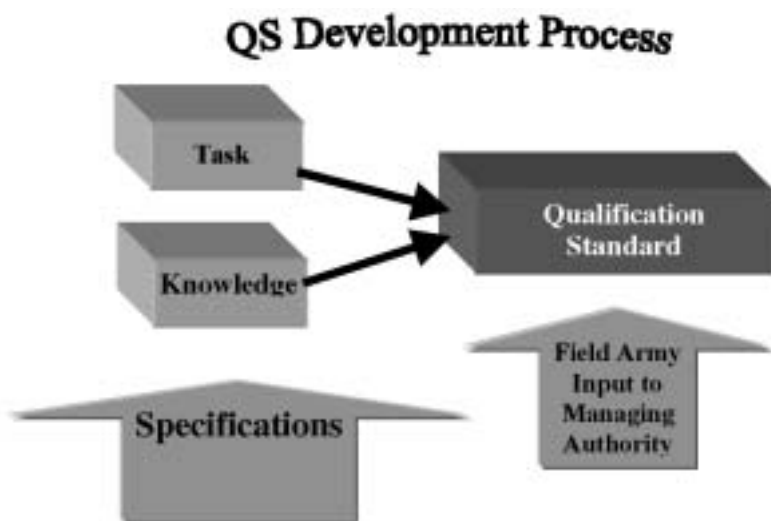


Figure 4

Training is developed by the managing authority (MA) for the respective MOCs. For the Army the MA is the Directorate of Army Training (DAT). DAT is responsible for developing a qualification standard (QS) for each DP. QS is a relatively new term. It is an evolution of the old course training standard or CTS. With the adoption of the DP system, only a single QS is produced for each DP for OS training, and most often, there are multiple training events or courses in each DP. Therefore, a QS can contain performance objectives (POs) for more than one course, hence the change from CTS to QS. Essentially the QS contains the PO, and thereby sets the standard for what training is to be conducted, and the level to which a given task is trained. Further, since training is tied to employment and employment is tied to operational readiness, the QS is developed in consultation with the field Army to provide a “user solution” for training. A Qualification Standard Writing Board (QSWB) is convened with representation from all four land force areas, Army Individual Training Development (AITD), the appropriate centre of excellence (COE) (which will ultimately deliver the training), and representatives from DAT to produce the QS. Figure 4 illustrates the process.

Once the QS is in place a training plan is developed. This responsibility is devolved from the MA (DAT) to the Combat Training Centre (CTC), in conjunction with the schools as COEs.

CTC convenes a Training Plan Writing Board (TPWB), which writes the enabling objectives (EO) for each PO and the schools produce courseware to deliver the training, (Figure 5). The schools then conduct a pilot course followed by an end course review (ECR). The training is revised as required and a steady state in training is reached.

The training component of the DP model is a one approach to training. This means that training is designed to be conducted from a unified Army approach to training rather than MOCs conducting their training in isolation. The result is a tiered structure to the individual training system where-by common training between two or more MOCs was identified and located in either a CF or Army training event. Only very specific MOC training is located in the MOC courses. The result is a reduction in redundancy in the training system, economising both time and resources.



Figure 5

The intent is to have training follow a pattern similar to OS development, meaning that each soldier will go through a progressive training event, each subsequent event building on the former. A soldier or officer will enter the Army, complete a CF training event followed by an Army training event and then completing an MOC training event. This progressive structure will continue throughout a soldier or officer’s career with CF, army and MOC training events existing in each DP level. In fact, as an individual’s career develops, the trend will be to move toward more army courses and fewer MOC courses, as a soldier begins to broaden his or her knowledge base.¹¹ This system also has the added advantage of familiarizing individuals with their peers outside of their own MOC and thereby contributing to a greater understanding of the roles of other arms in a combined arms team, and a sense of “one Army.”

The “one Army” approach has also caused significant changes as to how the Primary Reserve trains. With the increased operational tempo and the greater reliance on reserve augmentation in the 21st century, reserve training has been firmly established as a subset of the Regular Force training. The new QS are integrated documents that not only detail all training within a given DP, but also outline training for both the Regular Force and the Primary Reserve. As a result, there is one Army standard of training and one set of POs for both the Regular Force and Primary Reserve. Both components will complete the same POs to the same standard. The key difference between them is the amount of training each

component will complete. The Regular Force will complete all training contained in the QS, while the Primary Reserve will complete only a certain percentage of those POs.

This division of training has resulted in the development of three levels of training within which POs are categorized. They are the essential, supplemental and residual levels. The Essential Level is the training required for a Primary Reserve soldier or officer to be considered MOC qualified. It is the level of training a Primary Reserve soldier or officer requires to function as a Class A reservist, parading with their units "on the Armoury floor," so to speak. The supplemental and residual levels are the additional blocks of training, completed by the Regular Force. The key difference between them is that supplemental training is training that a Primary Reserve individual may be required to complete for a very specific tasking, i.e., augmentation with a Regular Force unit or employment on operations. Residual training is training that a Primary Reserve individual will never require as long as that soldier remains in the Primary Reserve. In conjunction with this, only one standard exists for POs. Both the Regular Force and the Primary Reserve complete the same POs to exactly the same standard. The difference is that the Primary Reserve completes fewer POs.

Training for both components will be more decentralized than it has been in the past, especially with respect to the Primary Reserve. The new training is designed to capitalize on various alternate methods of training delivery, like computer-based training. In addition, formations and units will have a greater responsibility to train their soldiers and officers, as a portion of the training is decentralized and designed to be conducted by either units or brigades. This has a tremendous advantage in allowing Primary Reserve soldiers and officers to train with a more flexible schedule, and it will reduce time away from home. This will be especially advantageous for those individuals who have difficulty in securing time away from civilian employment to undertake training.

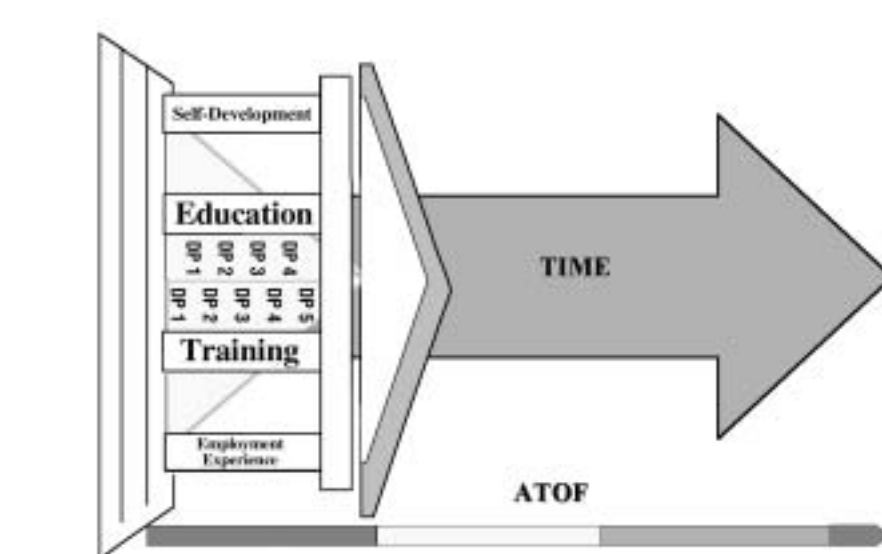


Figure 6

Standardising training in this manner has other advantages. First, there is only one standard, which reduces the amount of courseware and preparation time for the conduct of courses. Second, it will dramatically simplify granting equivalencies to individuals transferring between components, because supplemental and residual POs can be tracked through ITMIS (Individual Training Management Information System), and the difference in standard between Regular Force and Primary Reserve POs have been eliminated. Third, training for operational deployment will be more easily identified, since Primary Reserve soldiers requiring training will only need to train on those (supplemental) POs, which they lack and which are operationally required. The definition of training will allow for the creation of supplemental training packages for delivery at the schools, thus allowing operationally tasked units to prepare augmentees only during collective training. Supplemental training is individual training and is best conducted by an ATC or CTC. This will help ease the burden on operationally tasked units. Finally, this system will allow individuals to undergo supplemental training as opportunities present themselves.

With an understanding of the methodology of training development in place, the question arises as to what sort of impact all of this will have on career structures. In short, these changes will

have a dramatic, yet positive, impact. The new army career structure takes the four pillars of PD detailed in figure 1 and turns them horizontally thereby detailing a progressive linear career development that not only takes into account individual training but also considers collective training, time in, and operational requirements and employment (Figure 6).¹² In this way, the new structure is integrated into the Army Training and Operational Framework (ATOF).

ATOF is the model for Force Generation. It is a systematic and cyclical approach to force generation in that it details the three phases of force generation: Training, Operations, and Support/Reconstitution. Its role is "to synchronize the activities that must be conducted in the production of land combat capability."¹³ During these phases, individual training will as a rule, take place during the Support/Reconstitution phase. Individual training will normally not take place during the other two phases as it becomes disruptive to remove personnel from units during collective training and operations when unit cohesiveness and continuity are critical. In other words, individual training is planned for at the most opportune time to maximize efficiency in the training system and to deliver training to individuals when required and to manage the disruption of a unit's cohesion. It is the very essence of training to need.

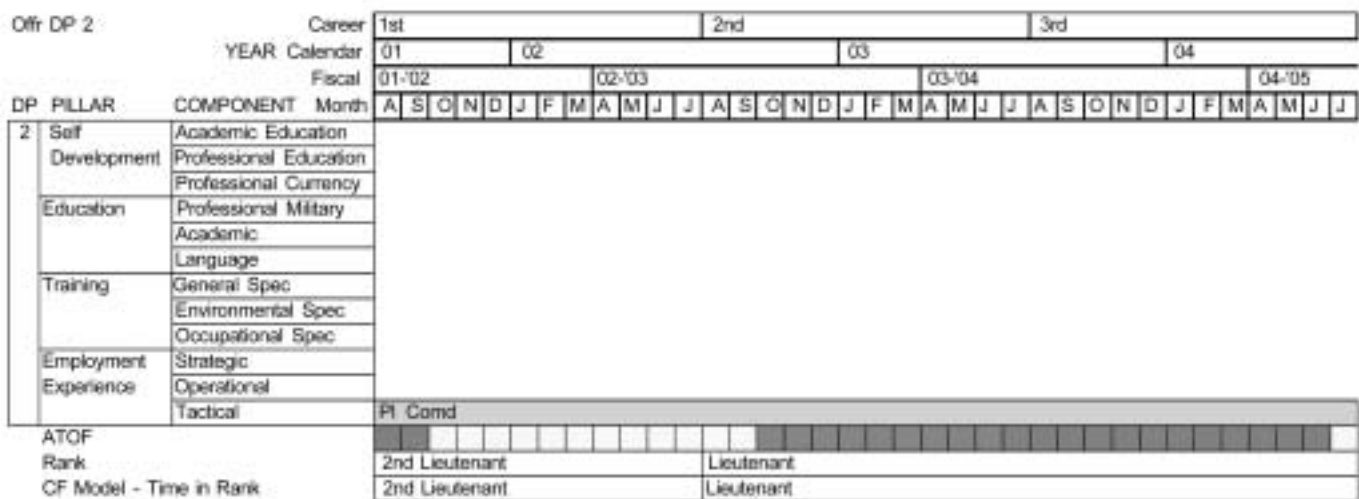


Figure 7

ATOF focuses on two domains of combat capability, collective and individual, and it is the individual domain, which determines career structure. Within the individual domain of ATOF, the model provides a linear progression for a soldier's career. Figure 7¹⁴ is a generic career structure, which graphically lays out a standard career in the Army by DP in relation to all aspects of employment.¹⁵ The DP is depicted in the far-left column of the chart, below which the pillars of the PD model are laid out. The pillars are further sub-divided into activity categories in the third column. Along the bottom, the ATOF cycle applicable to the individual's unit is laid out, as are the Army expected rank and the CF minimum time-in-rank scales for reference purposes. At the top of the chart, career years are used as the common denominator to avoid confusion over years of service that will vary depending upon individual terms of service (TOS).

The advantage to this model is the ability to predict a number of key factors, which will allow for a clearly defined career structure. First, the model allows

the system to predict a delivery schedule required to meet the PD requirements of all individuals. Second, the opportunities available for individuals to gain requisite individual training and education (IT and E) and experience can be determined and planned for. Third, links between specific experience and IT and E for individuals and groups can be determined. Fourth, accurate demand for IT and E and specific, linked experience can be determined, thereby creating greater predictability, and therefore efficiency and resource management within the training system. Fifth, the required capacity in the IT and E delivery system to meet the Army's demand can be more accurately determined. Finally, the effects of operational tempo changes on PD and IT and E can be measured.¹⁶ All of this allows the Army to better manage careers and ensure that operational effectiveness is maximized and resources are efficiently managed.

To conclude, the Army is committed to re-building the training system to make it more economical and efficient



ENDNOTES

1. B-GL-300-008/FP-001, *Training Canada's Army*, pp. 8 and 9.
2. Ibid., p. 8.
3. Ibid.
4. Ibid., p. 28.
5. Ibid.
6. Ibid.
7. Ibid., p. 27.
8. *Training Analysis Design and Evaluation Student Handbook*, Canadian Forces Training Development Centre, Part 1
9. *Canadian Forces Occupational Analysis Section Procedures Manual*. Directorate Personnel Planning, p. i.
10. Ibid., Chapters 1 to 4

11. The general trend for training will be for CF, Army and MOC training events to exist throughout the DPs. However, depending on the MOC and career path (Officer or NCM) some DPs may not contain a training event from each level. Some MOCs may only have an Army training event in the higher DPs for example. Additionally some MOCs may only have a CF training event in DP 1.
12. *ATOF Implementation Plan* (Draft 1) Annex H: Training.
13. Ibid.
14. Ibid.
15. Although Figure 7 details DP 2 of an Infantry officer's career as an example, the model is the same for NCMs and can be expanded to include any individual's career at any point.
16. *ATOF Implementation Plan*, Op cit.

Enabling the Army Strategy with Synthetic Environment Technology

by Dr. Paul A. Roman, CD, and Lieutenant-Colonel J.L. Cyr, CD

INTRODUCTION

The recent publication of *The Army Strategy (Advancing with Purpose)*¹ provides a catalyst for renewal in a time when there is broad acceptance of the requirement for Army transformation. In recognition of the continued scarcity of investment resources, the implementation concept as presented in the strategy suggests that energy will focus on areas where quantum improvements can be achieved and that quality will usually be preferred over quantity in order to produce consistency and mission success.² Synthetic Environment (SE) technology is a perfect example of one such area for investment. Consider this excerpt from the Commander's Vision:

*Using progressive doctrine, realistic training and leading-edge technologies, the Army will be a knowledge-based and command-centric institution capable of continuous adaptation and task tailoring across the spectrum of conflict.*³

Achieving this vision is based upon the implementation of a strategic framework that comprises four strategic objectives: Connect with Canadians, Shape Army Culture, Deliver a Combat-Capable Sustainable Force Structure and Manage Readiness. The emerging Army SE Strategic Plan currently being prepared describes how modelling and simulation (M&S) will be developed and employed as a fundamental enabling technology necessary to meet these objectives.

An SE links any combination of models, simulations, people, and equipment, real or simulated, into a common representation of a world. SEs will provide the Army with a powerful

and resource efficient medium for the exploration of doctrinal alternatives, realistic training, support to operations and experimentation into the applicability of leading-edge technologies. These efforts will help generate the knowledge base from which the command-centric institution will emerge with the tools it needs to continuously analyse and adapt across the spectrum of conflict. SEs will enable this transition by stimulating synergy, strengthening and extending previously discrete M&S activities, and by bringing a degree of consistency and concurrency across the spectrum of Army activities that have been previously unattainable.

THE SE DOMAINS

SEs are flexible and can represent the Operational environment and the equipment and forces which interact within it at varying levels of detail, scope and resolution. They can be tailored to user needs and address specific issues across the following five SE domains:

- Operations
- Training
- Concept development and experimentation (CDE)
- Research and development (R&D)
- Synthetic environment-based acquisition (SEBA)

SEs are not new to the Army. They have been applied to training for many years and more recently, with the creation of the Army Experiment Centre (AEC) in 1998, to combat development. Simulation support to on-going operations has been limited, but will increase dramatically in the near future. Tools are available now to provide battlefield awareness, mission rehearsal and to support course of action analysis. The R&D and SEBA domains are not, strictly speaking, Army-led activities;

however, the potential use and reuse of shared SEs across the five domains offers the potential to align these two SE domains in new and meaningful ways. SEBA has grown out of the need to link the Capability-Based Planning process in such a way that concepts identified as worthy of continued development are processed in a holistic and integrated manner, providing better capabilities, faster and cheaper than what has been achieved in the past. It is the linkage aspect of this process that is critical to effectively achieving these objectives. Concept development must be closely linked (possibly through technology demonstrators) to statement of requirements (SORs), request for proposals (RFPs) and contracts that ultimately deliver capabilities for which the Army has already employed SEs to develop doctrine, organizational structures and training. All of this must occur within a flexible framework that maintains potentially evolving operational requirements and user input as paramount. Although this description may seem self-evident, before the maturation of SE technology, there was no comprehensive way to make it a reality; this is no longer the case. Today, SEs can provide the glue that not only binds the overall acquisition and life-cycle management processes together, but also offers a means to do so with increased flexibility and tighter integration within reduced schedules and budgets (better performance, faster schedules and cheaper cost). In their report – *Simulation Based Acquisition: A New Approach*, Johnson, McKeon and Szanto⁴ make a compelling argument and offer several concrete examples of how this has been achieved in the United States (US) Military.

Until recently, SE activities have largely been conducted on a "stove-pipe" basis. However, recent technological advances in M&S, coupled with increasing investment on the part

of our allies and the Department of National Defence (DND), are resulting in an impressive effort to capitalize on the potential of these maturing and emerging tools. The Army will continue to employ SEs to help meet strategic objectives, however, in order to harness existing capability and harmonize effort and investment into new capabilities, there is a requirement for a comprehensive SE policy framework that will be developed in support of the Army's SE vision currently being formulated.

THE ARMY SYNTHETIC ENVIRONMENT VISION

The Army will exploit synthetic environments as the primary enabling technology necessary to effectively meet Army strategic objectives. SEs will merge the real and virtual worlds in ways that empower leaders to visualize the future, analyze decision alternatives and prepare for operations throughout the spectrum of conflict. In order to maximize effectiveness and optimize efficiency, Army SEs will be centrally coordinated to achieve appropriate levels of validation, standardization and modular development for potential use and reuse in a distributed environment.

ENABLING THE ARMY STRATEGIC OBJECTIVES

In order to achieve this vision, Army SE policy and development planning will be guided by the Army strategic objectives as follows:

- **Connect with Canadians.** There is no better way to demonstrate what the Army is doing than by letting Canadians experience it first hand. Rather than promoting the Army through show and tell type activities, SEs will allow everyday Canadians to actually experience what we do. This will promote a deeper understanding and facilitate communications with national leaders and decision makers who do not have the time to deploy on visits to actual operations. Furthermore, recruiting

from the millennium generation (those born after 1984), a group that is increasingly computer literate and fond of computer games, will be greatly facilitated with realistic simulations and simulators. Failure to appeal to this group in new and meaningful ways will potentially put the entire Army Strategy at risk.

- **Shape Army Culture.** This objective links to aspects of Connect with Canadians and aligns with three *Strategy 2020* Objectives – Innovative Path, Decisive Leaders and Career of Choice. Innovative paths are difficult to find and even harder to take in a culture that is rooted in tradition with substantial organizational inertia. SEs will be developed and exploited to both explore and develop innovative paths, but will be most crucial in demonstrating their potential. Visualizing preferred outcomes based on an innovative path developed and presented in an SE would provide the impetus necessary to overcome organizational resistance. Decisive leaders become so through experience; however, there are few real-world opportunities to gain this experience in an operational setting where decisiveness is most crucial. SEs will be exploited to ensure that leaders get the training they require in realistic scenarios that will provide them with the confidence they need when faced with difficult choices in real operations. Through the development of decisive leaders encouraged to explore innovative paths, the Army will create an appealing, learning culture capable of understanding how things should be, while at the same time appreciating how things are in reality. The resulting dialogue will naturally serve to reinforce the Army ethos and culture by fostering understanding and strengthening the essential bonds of trust required for combat effectiveness. The Army Strategy states: “*The ideal Army Culture would be one that exactly mirrors the Army Ethos.*”⁵ Although this ideal is practically unattainable, SEs

offer to provide a mirror through which we can study the differences between ethos and culture to better understand why the differences exist. This understanding will in turn help reduce the differences, helping the culture more closely reflect the Army ethos.

- **Deliver a Combat-Capable, Sustainable Force Structure.** The experimentation implications implied by this objective have resulted in the articulation of a 5-year target to “*enhance experimentation capability.*”⁶ This capability will be critical in supporting the analysis required to determine which combat capabilities are required and how to sustain them. Without a realistic representation of the future battlefield, a decision regarding which technological advances to pursue and their corresponding impact on force structure will be problematic. As a complex system of systems, combat capability needs to be understood with a future focus and in a holistic manner. The lens through which the Army will establish a future focus is the SE. Analysis of authoritative representations of future conflicts and technologies will enable decision makers to build consensus over contentious force structure decisions. Risk taking is inevitable; however, rather than relying on qualitative risk assessment, SEs offer the opportunity for visualization and quantitative risk analysis that will provide a degree of analytical rigour to the decision-making process that has not been possible in the past.
- **Manage Readiness.** Three aspects to this objective will be enabled through SE technology. First, readiness requires training: Achieving high degrees of readiness in the post-digitization era will rely heavily upon making use of SEs for both individual and collective training. Simulators, although expensive

to acquire, can achieve training requirements at a fraction of the cost of live training. Live training will continue to be important, but only to meet training objectives that are not achievable using simulation. Accordingly, realistic simulators should be considered as part of all new major equipment acquisition programs. Furthermore, stimulating the Army's actual command systems with constructive simulations (like Janus, CAST and ModSAF) is fundamental to achieving high degrees of readiness for battle groups and brigade staff collective training. Second, implementation of a managed readiness approach will need to incorporate the fundamentals of risk management. Accepting reduced levels of readiness for some units, as part of a cyclically managed readiness system, will result in the Army potentially being unable to fulfil short-notice requirements. The long-term readiness implications of accepting a short-noticed tasking can be effectively analyzed using modelling and simulation. Third, by linking to the Deputy

Chief of the Defence Staff (DCDS) contingency planners, SEs can be developed for potential theatres in advance of actual tasking such that just-in-time mission training and potentially mission rehearsal can be achieved in such a way that the time required to prepare for a specific mission is drastically reduced, further enhancing readiness.

CONCLUSION

Implementing the SE vision to help enable the Army strategic objectives, as described above, is the current responsibility of the Director of the Army Simulation Centre (Dir ASC). Dir ASC is tasked to draft or revise Army policy in order to ensure that the SE tools and practices needed to achieve this are available as soon as possible. This implies close coordination with allies and other departmental agencies working in this field.

In an attempt to keep *The Army Doctrine and Training Bulletin* readership informed about the developments achieved in this area, a series of articles will appear in this and subsequent volumes. The first paper, appearing in

this volume, is titled "Using Simulation To Estimate the Performance of the Situational Awareness System." It methodically presents all of the generally accepted steps of a simulation experiment and provides some interesting insights into what we might realistically expect from the situational awareness system when fielded. Next quarter, a paper titled "Meeting the Intellectual Challenge Posed by SE Technology" will be based on a presentation by the same title delivered to the Army Symposium (May 2002). It will not only define the intellectual challenge, but will also offer practical recommendations on how to meet them. Subsequent articles will present other simulation experiment results and provide updates on the status of SEBA and simulation training for the Army. It is hoped that these articles will both inform the readership of the important advances occurring in SE technology, but also stimulate the debate on the policy issues surrounding their employment in support of the Army Strategy.



ABOUT THE AUTHORS...

Dr. Paul Roman received his B.Eng and M.Eng degrees in Engineering and Management from the Royal Military College and his Ph.D. from Queen's University. His military service included duty with 4 Canadian Mechanized Brigade Group, two tours as an instructor at RMC, as Officer Commanding 2 (Electronic Warfare) Squadron and Director of the Army Experimentation Centre. Dr. Roman is currently helping to draft Army Synthetic Environment policy and continues to teach at both RMC and Queen's.

Lieutenant-Colonel Louis Cyr received a Bachelor degree in engineering from RMC. As a Military Engineer, he commanded 5^e RGC. LCol Cyr is a graduate of the French War College (Collège Interarmées de Défense). He was a Directing staff at the Canadian Land Force Command and Staff College for three years prior to taking his current position as Director of the Army Simulation Centre when it was created in June 2000.

ENDNOTES

1. *The Army Strategy, Advancing With Purpose*, Ottawa, 2002.
2. Ibid., p. 27.
3. Ibid., p. 13.
4. LTC M.V.R. Johnson, Sr., LTC M.F. McKeown, LTC T.R. Szanto, *Simulation Based Acquisition: A New Approach*, Defense Systems Management College Press, Fort Belvoir, VA., 1998.
5. *The Army Strategy, Advancing With Purpose*, Ottawa, 2002, p. 19.
6. Ibid., p. 21.

Using Simulation to Estimate the Performance of the Situational Awareness System

by Dr. Paul A. Roman, CD, and Major Bruce Chapman, CD

INTRODUCTION

The Canadian army is on the verge of fielding a command and control information system (C²IS) that will have a significant impact upon all of our current methods of command and control. With it come some myths and expectations that real-time positional awareness will be achieved on all vehicles all the time. Although the C²IS system will provide automatic positional reporting, the understanding of how close to ground truth this information will be is unclear.

The Land Force Command and Control Information System (LFC²IS) is a collection of hardware and software systems that will provide friendly position awareness and a series of tools that will assist commanders and staffs in developing and disseminating their plans. LFC²IS is composed of the Situational Awareness System (SAS), the Athene Tactical System (ATS), the Tactical Command, Control and Communications System (TCCCS) radio backbone and Titan. Although an integral part of the larger system, the scope of this paper is limited to examining the performance of SAS.

The Situational Awareness System (SAS)

SAS provides friendly positional awareness to the Land Force using the precision lightweight GPS receiver attached to the Situational Awareness Module (SAM). The information is transmitted over the combat net radio (CNR) network. The SAM module sends own station position reports (OSPRs) from each reporting vehicle.

The frequency with which these reports are sent is based upon either time, distance traveled or on demand. OSPRs are consolidated at a predetermined level (e.g., squadron) into a consolidated position report (CPR) that is forwarded to the next higher reporting station. Whether SAS operates on a dedicated data network or is a shared function across mixed voice and data networks (with voice having priority) has yet to be decided. However, this decision will have a significant impact on the overall performance of SAS and LFC²IS.

The Army has been conducting briefings to its personnel on SAS and ATS in order to prepare them for their pending deployment. Both the project management office and the Army

Digitization Office Kingston (ADOK) have conducted experiments in order to determine options to best deploy and employ the systems. These activities have been limited in scope in order to accomplish their particular aims. However, the exposure of SAS to the Army in both briefings and hands-on use has developed expectations, both positive and negative, regarding the potential performance of SAS. These expectations range from commanders having perfect situational awareness all of the time to the opposite extreme where some may believe that the system will provide no improvement on our current ways of conducting operations. Realistically, the performance will prove to be somewhere between these extremes. Overall expectations, however, are probably high because the

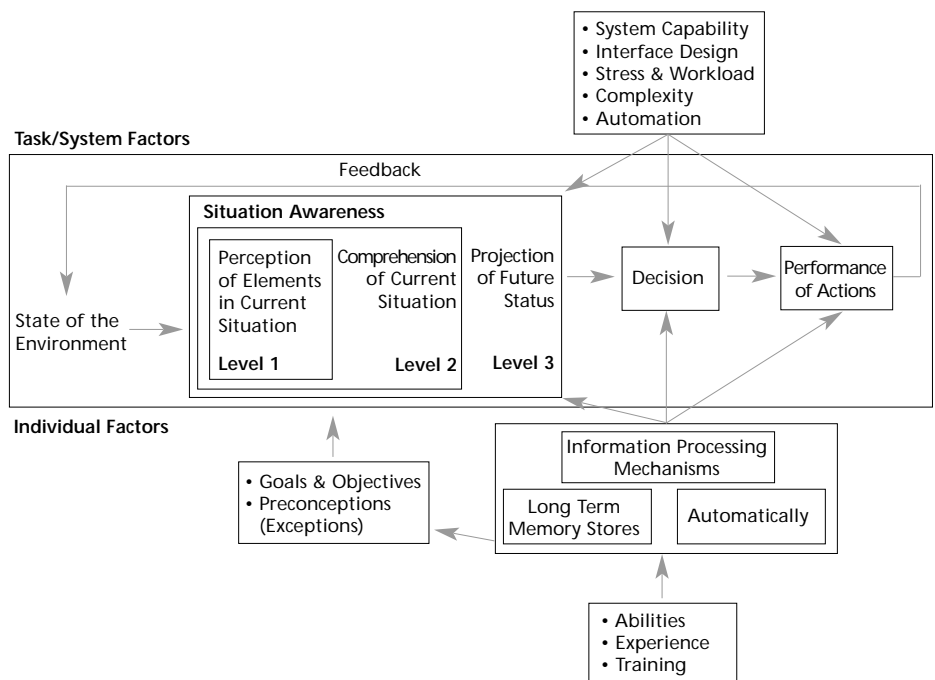


Figure 1 - Situational Awareness Model (Endsley, 1995)

system name implies the provision of situational awareness as opposed to the friendly positional awareness that the system is actually designed to provide. Endsley¹ proposes three levels of situational awareness—perception, comprehension and projection—as depicted in Figure 1.

To perceive the situation at the first level, the commander must have accurate static and dynamic data on all forces and environmental elements that can potentially affect operations. This would be termed Blue (friendly), Red (enemy), White (neutral) or Brown (environmental) situation awareness in current doctrine.² When these disparate elements of Level 1 situation awareness are assembled and patterns emerge, the commander forms a holistic picture of the environment and comprehends the significance of the various objects and events, thus achieving Level 2 situation awareness. This Level 2 awareness is enhanced into Level 3 awareness through the combination of the holistic picture with the dynamic (movement or activity) information related to the object. Although SAS has the potential to contribute to Level 3 awareness, it is currently limited to providing Level 1, and even this is limited to only friendly positions. Furthermore, beyond the misleading perceptions of what SAS will actually provide, the field performance of the system has yet to be determined. It is wise, therefore, to establish a manner of examining the likely performance characteristics of the system.

AIM AND SCOPE

The aim of this paper is to provide insights into the likely performance characteristics of SAS. This will be achieved through a simulation study that will examine the impact of equipment casualties and radio net configurations on simulated transmission of OSPRs and CPRs within an armoured regiment.

METHODOLOGY

The remainder of this paper follows the five steps of a simulation study as described by Evans and Olson.³ The five steps are:

- develop a conceptual model of the system or problem under study;
- build the simulation model;
- verify and validate the model;
- design experiments using the model; and
- perform the experiments and analyze the results.

Develop a Conceptual Model

This step consists of several sub-steps that include:

- understand and define the problem;
- identify the goals and objectives of the study;
- determine the important input variables; and
- define the output measures.

Understand and Define the Problem

As stated in the introduction, there appears to be a prevalent expectation in the Army that SAS will deliver the ability to have real-time positional awareness. To achieve this in an armoured regiment, all systems would have to work at one hundred percent efficiency, which, of course, is practically unattainable. Therefore, the problem that this paper will address is the requirement to make these expectations more reasonable.

Identify Goals and Objectives

In order to change expectations, people must be able to observe the system in action in a manner that is easily understandable. Since the system has yet to be fielded, simulation offers a means to demonstrate the system under various simulated circumstances. Therefore, the goal of this simulation is to demonstrate SAS under circumstances that reflect the operational environment. Since all simulation models are limited and cannot perfectly represent the real world, it is recognized

that the results will need to be interpreted carefully and should focus on the key factors that appear to be influencing expectations.

Determine the Important Input Variables

Within an armoured regiment, the vehicles are equipped with two radios. At troop level, only one of these radios is used (squadron net). Each squadron commander relays the OSPRs received from the squadron vehicles to the regimental headquarters on the regimental net as a CPR. Current plans call for the regiment to operate on a mixed voice and data net. The baseline simulation model must reflect this situation. However, for the purpose of this study, the simulation must also be able to demonstrate the impact of the following factors on the system's performance:

- vehicle losses (casualties);
- performance problems with CNR caused by failures in equipment, atmospheric influences and line-of-sight issues (fade);
- adopting data only radio nets;
- adopting troop radio nets; and
- varying the number of vehicles that are required to submit OSPRs.

Define the Output Measures

The simulation output that will be used to demonstrate the effect of these factors is the percentage of time that the system is operational. This output, when compared relative to the outcomes of each scenario, will give some insight into the relative performance of the system under these different circumstances.

Build the Simulation Model

Evan's and Olsen⁴ state that this step includes the following sub-steps:

- develop appropriate formulas or equations;
- collect necessary data;

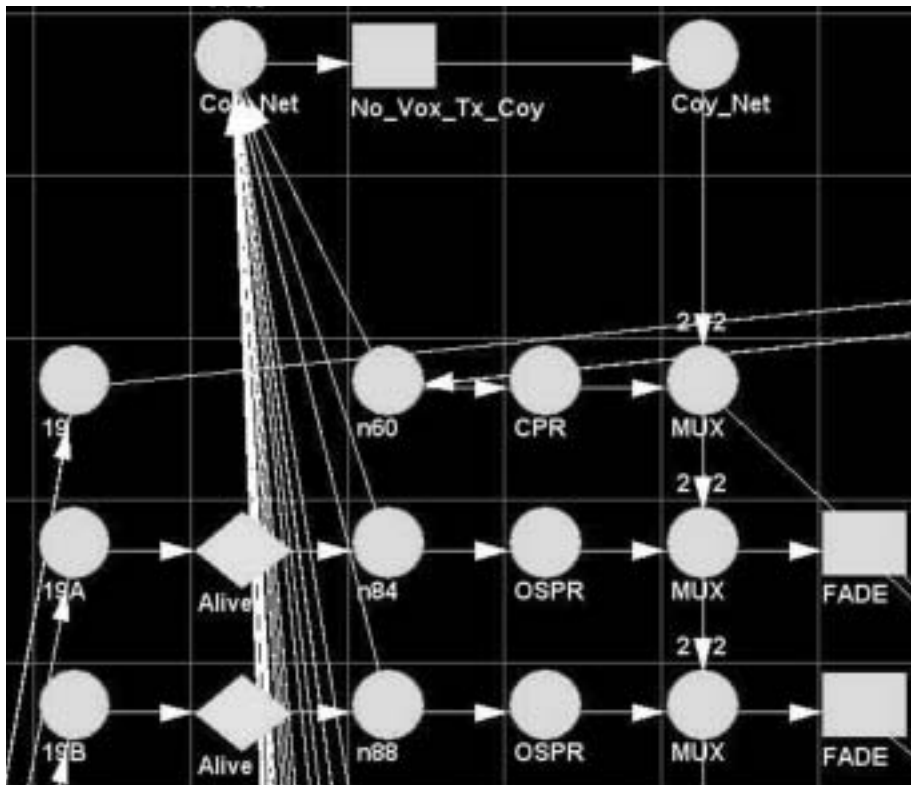


Figure 2: Sample RAPTOR Model

- determine the probability distribution of uncertain variables; and
- construct a format for recording the results.

Develop Formulas or Equations

This sub-step is not directly applicable to this study. However, there are two aspects of this simulation that would fit under this heading:

- the selection of an appropriate simulation language or package; and
- the building of the model using the selected simulation language or package.

The number of object-oriented simulation packages available for this type of study is impressive. They include spreadsheet add-ins like Crystal Ball and stand-alone commercial packages designed for discrete event simulation like EXTEND, PROMODEL and SIMUL 8. Nevertheless, one package, called the Rapid Availability Prototype for Testing Operational Readiness (RAPTOR),⁵ was developed

by the US Air Force specifically for this type of study. It was further determined that the RAPTOR tool could most easily demonstrate the differences required within the context of the problem. RAPTOR was relatively easy to learn and could adequately simulate the variables within the problem under study.

RAPTOR was used to model the transmission of OSPRs from individual vehicles to the squadron commander. Squadron commanders then retransmitted to the regimental headquarters by sending CPRs.

In RAPTOR a series of connected nodes representing the various components of the system are modeled as reliability block diagrams, which are used in this study to represent the transmission of the OSPR and CPR messages (Figure 2). An event node (blue diamond) was added to model vehicle status. This was a one-time determination at the beginning of each run to simulate possible casualties. Vehicles that were deemed casualties at the start of a run would not submit either OSPRs or CPRs.

A series of parallel blocks were also included in the model to simulate the impact of voice traffic having precedence over data traffic. The purpose of these blocks was to model the shutting down of the data traffic whenever there was a voice transmission as currently planned for mixed voice and data radio networks.

Finally, a block was added to simulate the chance that even if the vehicle survived and the SAS equipment worked properly, it was still possible for poor communications conditions (fade) to keep the message from reaching its destination. Once the vehicle communication models were built, the network models were made for each of three squadrons that were then combined into the RAPTOR model presented in Figure 3.

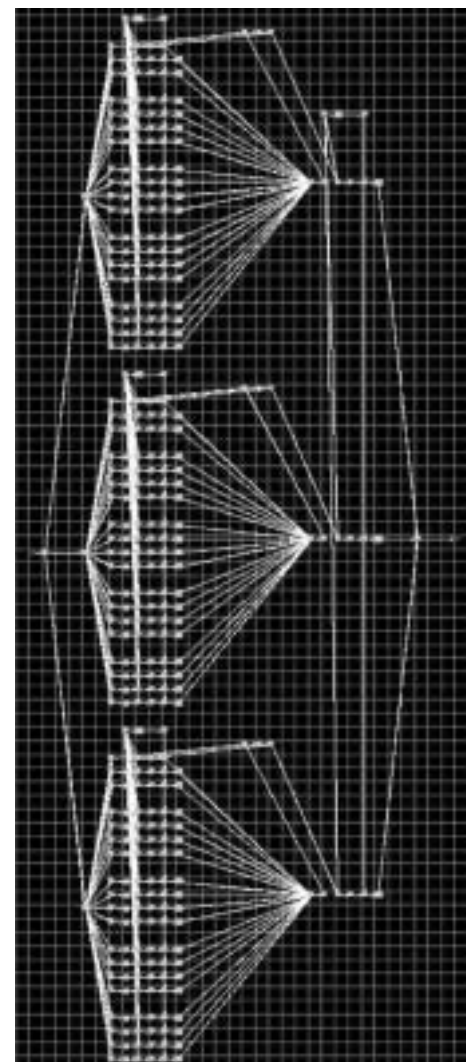


Figure 3: The Baseline RAPTOR Model of an Armoured Regiment SAS

Collect Necessary Data

In order to provide the simulation with adequate input parameters, the following information was required:

- the probability that a vehicle would be “alive” at the beginning of a simulation run;
- the probability that a message would experience “fade”;
- the probability that the company and regimental nets would make voice transmissions; and
- the threshold number of vehicles required to report in order for the SAS mission to be deemed a success.

Determine the Probability Distribution of Uncertain Variables

Although there have been many studies on the survivability of tanks and commanders in battle, the estimates about how long a tank will survive on a future battlefield vary significantly. For the purpose of this study, an arbitrary probability of a casualty occurring of 0.7 (70%) was selected. This parameter, although clearly uncertain, was held constant for all scenarios such that differences in SAS performance could be considered independent of this factor.

Fade was assessed as having an exponential distribution with a mean of 100 minutes. This fade was “repaired” with a frequency determined by a lognormal distribution with a mean of 1 minute and a standard deviation of 0.2 minutes. Although there are no hard numbers to validate the probabilities of occurrence and repair of fade, this block performed the function of inducing minor errors to inhibit the transfer of the OSPRs and CPRs while “repairing” the fade in a relatively short period of time. Again, the parameters for distributions were held constant for all iterations.

The probability that a net was not being used by a voice transmission was assumed to be an exponential distribution with a mean of 0.5 minutes. Repairs or release of the net was

assumed to follow a normal distribution with a mean of 0.1 minutes and a standard distribution of 0.01 minutes. There was no data readily available to make this determination, however, testing was conducted to ensure these communications were quasi-realistic.

Lastly, the level of positional awareness required by squadron and regimental commanders to deem that they have adequate positional awareness (i.e., SAS mission success) needed to be determined. This performance threshold can be adjusted; however, for ease of comparison of the scenarios, it was held constant. In all scenarios, ten of nineteen tanks were required to report OSPRs before a CPR was sent to the regiment. At the regimental level, all three squadrons were required to report to enable the SAS to have been deemed successful.

Construct a Format for Recording the Results

RAPTOR provides simple to read output with the key calculations already performed for each set of iterations. These quantitative results are recorded into tables for qualitative analysis.

VERIFY AND VALIDATE THE MODEL

Verification

Verification is defined as the process of determining that a simulation accurately represents the developer's conceptual description and specifications. Verification evaluates the extent to which the simulation has been developed using sound and established software engineering techniques. In this study, it was assumed that the RAPTOR program was adequately verified. The actual models used for testing were built in stages, starting with simple vehicle models that were tested before networking them together.

Verification of the input distribution parameters should also be conducted. However, verifying failure and repair times for systems that have yet to be fielded is impossible. Consequently, a lot of educated guessing was necessary. However, even if the assump-

tions are wrong, their impact on the results is minimized as the probability distributions were held constant for all models and scenarios. Furthermore, rather than analyzing the output of a single scenario on an absolute basis, the analysis focused on relative comparisons between scenarios. Hence, although we may not have a large degree of faith in the absolute values of any particular simulation run, the overall results are based on relative comparisons between scenarios where these uncertain parameters were held constant.

Validation

Validation is defined as the process of determining the extent to which a simulation is an accurate representation of the real world from the perspective of its intended use. Validation methods include expert consensus, comparison with historical results, comparison with test data, peer review, and independent review. Again, the modular approach to building the RAPTOR model for this project was validated to ensure that each new addition to the model was built on a sound foundation.

First, the model describing the SAS capability of an individual vehicle was constructed. The troop structure was constructed based on this vehicle, which, in turn, was used to create the squadron model. The communication net was built and tested to see if the impact it had on the system would be as expected. Once the squadron structure was completed it was replicated to form the regiment structure. Each variation of the model was constructed in a similar fashion and sample runs were conducted to validate each model's overall performance.

DESIGN EXPERIMENTS

This stage entails determining the values of the controllable variables to be studied or the questions to be answered in order to address the decision maker's objectives. Therefore, as the aim of this experiment is to provide insights into the expected performance of SAS, a comparison of the system's availability is required. Within RAPTOR the output indicates a

	% Green				% Yellow				% Red				
	Mean	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Total Avail
Status Quo													
Mixed no cas	31.08	27.48	35.20	2.65	23.13	17.16	28.00	3.14	45.79	44.05	47.64	1.48	54.21
Mixed cas	0	0	0	0	31.42	0	80.66	38.50	68.58	19.34	100.0	38.50	31.42
Data no cas	57.71	51.52	64.74	4.68	38.67	33.89	42.36	3.47	3.62	0	6.58	2.37	96.38
Data cas	0	0	0	0	39.28	0	99.44	48.11	60.72	0.56	100.0	48.11	39.28
Troop Nets													
Mixed no cas	9.17	6.92	11.05	1.34	44.47	42.78	47.79	1.73	46.35	45.29	48.21	1.10	53.65
Mixed cas	0	0	0	0	11.97	0	59.85	23.94	88.03	40.14	100	23.94	11.97
Data no cas	47.94	42.68	53.91	4.15	34.19	27.80	40.59	4.44	18.27	16.73	20.30	1.28	81.73
Data cas	0	0	0	0	36.95	0	63.26	30.19	63.05	36.74	100	30.19	36.95

Table 1: RAPTOR Simulation Results

percentage of time that the system was either green, yellow or red.

- Green – indicates that the system is running without any failures. In this model, that means that all 19 tanks are successfully transmitting OSPRs to each squadron commander and all three squadron commanders are successfully transmitting CPRs to the regimental HQ.
- Yellow – indicates that the system is experiencing component failures but continues to function. This means that fewer than 19 but at least 10 tanks in each squadron are successfully transmitting OSPRs to squadron and all but three squadron commanders are successfully relaying these to regimental HQ as CPRs.
- Red – indicates a system failure. This means either fewer than ten tanks are reporting in one of the squadrons or at least one of the squadron commanders is not sending CPRs to regimental HQ.

By comparing these outputs across the experimental conditions, we can make inferences about the relative performance in each scenario. This was conducted for both the status quo

(baseline) option with only squadron radio networks and the option of establishing of troop nets.

PERFORM EXPERIMENTS AND ANALYZE THE RESULTS

The models were put through a simulation representing the transmission of 60 OSPR messages over 5 runs. If each OSPR were sent on a 5-minute time interval, then the total time of the simulation would be 5 hours. The scenarios were conducted with and without equipment casualties to simulate the use of SAS in and out of contact.

Perform Experiments

The scenarios that were simulated were:

- Status Quo
 - mixed net without casualties
 - mixed net with casualties
 - data net without casualties
 - data net with casualties
- Troop Nets
 - mixed net without casualties
 - mixed net with casualties
 - data net without casualties
 - data net with casualties

A summary of the results of the simulation is presented in the Table 1. The total availability column is calculated as the sum of the mean % Green and % Yellow time.

Analyze Results

Table 1 shows that, regardless of the configuration, the system fails to provide 100% positional awareness all of the time. It also suggests of the following:

- When data only nets are used, a significant increase in system performance is observed. Total availability without casualties increases from 52 %to 96% and with casualties from 31% to 39%.
- When casualties are considered, the system's capability to provide positional awareness is significantly decreased.
- If the casualties include any of the CPR producing vehicles, the system experiences a catastrophic failure. The loss of a single squadron commander's tank results in the loss of ability to get CPRs from an entire squadron. This suggests the requirement to introduce a redundant means by which a squadron can submit CPRs if the squadron commander's system is not available.
- The addition of a separate troop net does not appear to provide any increase in capability. In fact, it decreases the total availability of the system, which goes from 54.2% to 53.9% for mixed nets without casualties. This is most likely due to the increased

number of CPR producing nodes and the impact of casualties to these now crucial systems.

necessary fidelity to demonstrate that current expectations of SAS performance in operations may be optimistic.

over the CPR transmission requirement or redundant hardware.

CONCLUSION

The aim of this project was to provide insights into the expected performance of the Situational Awareness System. Although the models developed were basic and the probability distributions used to determine the uncertain variables utilized best guesses, the simulations provided the

Further insights were also gained in the use of this simulation. The impact of the loss of key nodes that produced CPRs had a catastrophic impact on the system as a whole. It is recommended that further studies be conducted in order to determine methods to reduce this vulnerability of the system. This may include procedural options such as having the second in command taking

Although SAS and LFC²IS are almost in the fielding phase of acquisition, models and simulations such as the ones presented in this project are still useful in managing the expectations of end-users.



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ENDNOTES

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The Foundations of Strategic Management of the Army:

A Necessary Return to the Military Roots of Organizational Strategy¹

by Captain Yan Cimon

INTRODUCTION

What are the foundations of any future strategic management in the Army? As we shall see in the course of this article, organizational strategy, while influenced by such authors as Ansoff, Andrews and Porter, nevertheless has roots that go back much further.² Organizational strategy also dates back conceptually farther than the first course on *Business Policy* given at Harvard in 1908. Many of the “classical” authors propose theoretical frameworks that, even though they are taken from basic disciplines other than management, nonetheless allow for an appreciation of organizational strategy in a more fundamental light.

This paper makes no claim to write the history of the concept of organizational strategy: our aim is simply to propose an original reading of the military foundations of strategic management, which is especially relevant to any future strategic management of the Army. Although this paper makes no claim to being exhaustive, the hope is that it may constitute a starting point for a process of reflection on military strategy as the foundation of the strategic management of organizations and, specifically, of the Army as an organization. It is a little like the formless clay that a potter places on his wheel and gradually shapes, imbuing it with life. To borrow Beinhocker's image, we would postulate that the *raison d'être* of strategy is the reduction of uncertainty.³ But what uncertainty are we talking about? Is it perhaps the survival of the organization or, more prosaically, its desire to ensure its own permanence? If we admit that, we are

forced to concede that the existence of strategy is undoubtedly the result of a degree of indeterminism in the environment and thus of the existence of organizational, or individual, free will.

Our argument will be structured around three major axes. First, we will examine the etymology of the word “strategy” as well as its definition in order to establish a common conceptual basis that we can share with the reader for the remainder of the article. Second, we will examine the military roots of strategy and their application to management. Third, we will see how strategy has carved out a place for itself in management.

STRATEGY: ETYMOLOGY AND DEFINITION

Before proceeding with our discussion of the foundations of organizational strategy, we must first ask where the word comes from. Evered explains:

The word strategy comes to us from the Greek word *strategos* strictly meaning a general in command of an army (*stratos*, army; *-ag*, to lead). In 500 BC a *strategia*, or board of 10 generals, was set up in Athens as a way of coordinating 10 tribal units and diffusing power.⁴

Thus, over time, the idea of *strategos* has developed from its initial meaning of the representation of a role to, in Pericles, that of the art of command, evolving, with Alexander the Great, to mean the judicious use of force to defeat the opposition in order to govern better.⁵

What, then, is the definition of strategy? Strategy is “the intelligence of power relationships.”⁶ We have retained this definition because of its holistic nature. Contemporary definitions of organizational strategy vary greatly depending on the school of thought espoused by their authors and become more complex as the years go by. Chandler affirms that:

Strategy can be defined as the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals.⁷

Closer to home, Mintzberg et al go farther: for them, strategy can be defined simultaneously as a plan, a model, a position, a perspective and a stratagem.⁸ They also outline ten schools, each of which has its own specific strategy-formation mechanism: the design school sees strategy formation as a process of conceptualization, the planning school views it as a formal process, the positioning school as an analytical process, the entrepreneurial school as a process of vision, the cognitive school as a formal process, the learning school as an emergent process, the power school as a process of negotiations, the culture school as a collective process, the environmental school as a reactive process, and the configuration school as a process of transformation. These definitions and this growing complexity have a military point of departure, as we have seen in our examination of the origins of the word strategy. What, actually, is this starting point?

THE MILITARY ROOTS OF STRATEGY

The origins of organizational strategy are to be found in military practice. We will describe first the classical approaches to military strategy, which are nonetheless relevant to the contexts of business or the administration of public-sector institutions with which we are familiar in our own day. After exploring the foundations of strategy, we will then examine a number of more recent views of this discipline from a business-oriented standpoint.

The traditional approaches of (military) strategy are presented here in order to grasp their conceptual influence as it appears in contemporary works. The first important strategist, and probably the one with the greatest influence first on military strategy and then on business strategy, is Sun Tzu, who is reputed to have uttered the following maxim over 400 years before the birth of Christ and shortly before Thucydides wrote his chronicles of the Peloponnesian War: "Know your enemy as yourself."⁹ He also postulated principles of warfare that remain in use to this day.¹⁰ The ultimate aim of strategy was for him to conquer, if possible, without fighting. More recently, Leonhard goes farther and proposes that knowledge and ignorance be postulated as the primary motivation, since within them lie the origins of action and thus of success.¹¹ In this sense, he is proposing a dialectical vision of strategy, based on the implementation of the principles of war.¹² These two authors are not proposing a "modern," documented definition of the concept of strategy that would be as eloquent as that put forward by Clausewitz (even though his influence on Leonard is clear). Clausewitz conceptualized war as an interaction of opposing forces, as emerges from his definition of strategy: "the use of battle as the means of achieving the object of the war."¹³ He dissects the elements of strategy as follows: morale, leadership, military qualities, presence, perseverance, superiority in numbers, surprise, ruse, the concentration of forces in time and space, reserves of forces and economy of effort.¹⁴ He had said: "War is the continuation of politics by other means."

Closer to our own day, Liddel Hart introduces the relationship of politics to strategy; in this sense, he refines the approach of Clausewitz, in whom this concept is present only implicitly.¹⁵ He divides strategy into the dichotomy of *grand strategy*, which is national strategy incorporating a macro vision, versus *pure strategy*, with a heavy emphasis on military content and hence micro. He states the aim of strategy prosaically as the creation of the conditions for victory and hence as the search for an advantage, thus clearly separating tactics from strategy. He identifies the flexibility that is necessary for a war of manoeuvre.¹⁶ Aron examines the sociological aspect of what he regards as the collectivity (or organized groups) as the unit of analysis.¹⁷

As we have just seen, the classical military approaches to strategy have lost none of their relevance in our own day. The constructs associated with them allow for their transposition into the world of organizations and, by extension, into the world of the management of Army affairs. Lo, Ho and Sculli found, while studying the personnel in a number of Asian companies, that the principles of Sun Tzu retained a far-reaching degree of relevance in terms of both quality management and the management of the entire organization.¹⁸ Lee, Roberts, Lau and Bhattacharyya argue similarly, although the thrust of their research is somewhat different.¹⁹ They compile a table comparing the military strategies of Sun Tzu with familiar modern competition strategies. Not only do they note a predictable similarity, but they also provide us with the keys to an analytical framework of organizational strategies derived directly from them. This type of reasoning can nonetheless have certain limitations for anyone who is studying strategy. Le Roy sets out the limits of the applicability of the principles of military strategy to management. He shows us the pitfalls arising out of ontological, metaphorical and analogical transfers. He concludes therefrom that contextual differences do not allow for a ready transfer to management of the constructs of military strategy. We must accordingly be cautious in the application of military strategy and management, although there can no longer be any doubt as to its relevance.

STRATEGY AND MANAGEMENT

While military strategy has undeniably influenced the strategy of organizations as we know them, it has itself been influenced by many authors and notable personalities who have on each occasion moved it closer to an independent, autonomous theoretical construct.²⁰ If, prior to the 20th century, strategy was primarily military, it has loomed on the horizon for a very long time. We have opted here deliberately to refer to Machiavelli as one of the first great theoreticians of strategy. We could have started with Socrates, Plato, Aristotle or other eminent thinkers, but we do not wish to stumble into the pitfalls of triteness, ethnocentricity or anachronism. Machiavelli has the specific quality that he allows the individual actor, in this case the Prince, the exercise of his own free will. The Machiavellian world is not entirely determined, since *fortuna* and *virtù* cohabit.²¹ Machiavelli's leader is calculating, rational and crafty. With Machiavelli, we see the emergence of the "modern" leader. Strategy can thereafter be perceived as the totality of methods implemented to achieve any objective.²² If the issue of the leader is thus raised, we must attempt to examine the organization over whose destinies he presides, wholly or partially. Cicero neatly summarizes the birth of the organization: "And soon, concord forged a city from an errant, scattered multitude."²³

The contributions of Hobbes, Locke and Rousseau regarding, among other things, the state of nature, thus assume their full meaning, for regardless of whether man in a state of nature is good or evil, their contributions lay the foundation for the necessity of the existence of the modern state—a quintessential organization. Similarly, Montesquieu, in affirming the importance of the rule of the law, structures the action of an organization. Smith, for his part, sees the organization as subject, at least partially, to the implacable action of his "invisible hand." He nonetheless perceived the efficiency of the division of labour, prior to its being implemented in practice by Ford or rendered scientific by Taylor and his *One Best Way*. Marx

also was to show how an industrial enterprise is not completely determined, in that it can serve the interests of the bourgeois while alienating the proletariat. Even though his primary focus is on the relationships of domination engendered by industrialization, Marx nonetheless is a seasoned economist. The organization takes on a structured, rigorous form through Weber's bureaucracy. But what role does technology play in all that? Schumpeter proposes that innovation occurs in a series of lurches, occurring randomly over time. Malthus, his many detractors notwithstanding, nonetheless recalled the importance of using available resources efficiently, as they exist only in limited quantities.

These theories taken directly from the fields of political science and economics nonetheless remain incomplete. Wren and Greenwood have partially redressed the balance. Their account of advances in management shows the extent of their formative influence on strategy. They take place during or after the Industrial Revolution, as this allowed types of work organization to incubate that would not have been possible without the problems generated by its advent. Here we would like to put readers on their guard against hasty generalizations: Wren and Greenwood's vision is primarily America-centric. However, the merit of their contribution is that they include not only management theorists, but also industrial leaders who have influenced modern American management. They state:

Management is an ancient practice; it had its place (and still does) in government, religious, military, and other types of early organizations. Yet none of these grew to the scale and scope of modern business enterprise, which needs not only to adapt ever-changing economic, social, and political forces, but also to do this in a profitable fashion.²⁴

They thus introduce us to the works of a number of individuals who have left their stamp on American managerial thinking and, by extrapolation, on strategy. An organization's strategy is often implemented through

a specific function that the organization masters better than its competitors (this frequently remains true today). Andrew Carnegie (1835-1919), the founder of Carnegie Steel, was able to apply the principles of operations management, which he had learned while working for a railway company, to his steel mills. Richard W. Sears (1863-1914), the founder of Sears Roebuck, catered to the needs of customers in areas of the United States far from major centres with his catalogue order system, creating an impressive distribution network. J. Pierpont Morgan (1837-1913), the founder of JP Morgan, was able to put together the financing for the railway industry and for the mergers and acquisitions that laid the basis for financial markets and corporate financing as we know them today. Mayo and the School of Human Relations in part discovered psychological determinants from the performance of employees at Western Electric. The examples are manifold. They show us organizational strategy, often influenced by its military counterpart, in action.

It is nonetheless clear that, in terms of the strategy of organizations which draw their inspiration from American practice, the classical view of strategy incorporates two complementary approaches: on the one hand, an organization that wants to compete with its rivals must adopt a cost control strategy; on the other hand, it must be capable of stimulating its sales by means of its marketing effort. Cost control is essential for government organizations which have no mandate to make a profit; the best example of this is ASD (alternate service delivery) under which certain activities of the Canadian Forces were sub-contracted out to civilian organizations to make them more efficient (i.e., to maximize the service delivery effort while minimizing the costs). Noël enthusiastically insists on a strategy oriented around the product-market combination, which is articulated around strategic activity centres.²⁵ Porter opts to present a strengths/weaknesses analytical framework so that the organization becomes aware of its assets in the face of the heavy pressure of competition with which it must deal in order to survive

and prosper.²⁶ This brings us to Buckley, who posits that the managers of an organization play a high-profile role when the logic of the market forces the enterprise to internalize certain activities in order to guarantee a certain level of competitiveness.²⁷ Following the same logic, the converse is also possible; some activities must be entrusted to the market if they cannot be carried out at lower cost. In other words, if "doing them" is more expensive than "having them done." Within a logic of competition or responsibility to the public, the organization cannot make use of every resource available. Hamel and Prahalad demonstrate this through several examples of organizations whose strategic thrusts are deficient, while others were able to grasp and profit from their skills through a strategic management architecture.²⁸ For a public-sector organization such as the Army, the paramount consideration is the logic of the strategic, efficient employment of expensive, limited resources.

CONCLUSION

In conclusion, we have shown, through this modest overview, that strategy is a complex field of study, about which the academic community, let alone the practitioners, are far from unanimous. While the field is relatively young, the fact remains that both the strategy of organizations and military strategy have been strongly influenced by the "classical" authors.

We have seen that strategy refers conceptually—and has done since it originated—to the military idea that it presupposes. If it is defined as the intelligence of power relationships, it is also perceived as the setting of long-term objectives while acquiring the means to achieve them. Organizational strategy has strong military roots in Sun-Tzu, who developed the principles of warfare, or Clausewitz, the theorist of the Napoleonic Wars. These two have many emulators among our contemporaries, some of whom question the applicability of military strategy to organizations. This may be limited, since strategy and management remain dependent on the classical thinkers. Without Machiavelli's Prince and the works of Hobbes, Locke,

Montesquieu and others, without the implementation of strategy in practice by the likes of Carnegie, Sears or Morgan, the subject would probably not be perceived in the way it is today. However, strategy as a construct, without achieving unanimity, is steadily growing in complexity. What these examples add as a contribution to the military universe is that, the necessary adaptation notwithstanding, military strategy constitutes an excellent vantage point for conceptualizing organizational strategy, which, in turn, can potentially be manifested in the strategic management of the Army.

The key then is to identify more clearly the influence exerted by the humanities on strategy, not only in order to understand the ideas generated thereby, but also to develop them sooner. Utility theory, transaction costs, the management of technology, Gordon's financial models and CAPM (Capital Asset Pricing Model), quality management, the product life cycle and others have all impacted to varying degrees on strategy as we know it. In a military context, these theories and techniques allow us to integrate the processes and efficient management of the Army so that it can accomplish its mission

beyond the criteria set for achieving its objectives. As a consequence, it remains relevant to examine the real contribution of military strategy and its influence on organizational strategy for strategic management of the Army, if only by virtue of the complexity, an understanding of which is essential in these uncertain times.



ABOUT THE AUTHOR...

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ENDNOTES

1. We would like to thank the Centre d'études en administration internationale (CETAI) [Centre for Studies in International Administration] at l'École des hautes études commerciales – Montréal for financial support for part of this article. The content of this article reflects the opinions of the author alone.
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The 1967 Sinai Campaign

Some Lessons About the Manoeuvrist Approach to Operations

by Major L.R. Mader, CD

BACKGROUND

With the 1998 publication of its new capstone manual, *Canada's Army*,¹ the Canadian Army adopted a doctrine more explicitly oriented to the morale aspects of conflict. Explanations and refinements of this doctrine, the Manoeuvrist Approach to Operations, also called manoeuvre warfare by some armies (hereafter referred to as Manoeuvrist Operations), have been published in subsequent manuals and described in various forums.² Although the broad utility of Manoeuvrist Operations as a doctrine for the Canadian Army has been questioned³, the basic tenets of this doctrine are in this writer's opinion relatively self-evident, well grounded in the art of war, and flow from the experience of human history.

However, this doctrine, along with its critically related mission command philosophy, has become wrapped up in the discussions about the currently popular, perceived revolution in military affairs (RMA). This intermingling of the two concepts has resulted in Manoeuvrist Operations's logical and common sense approach to military operations becoming lost for some officers, including, seemingly, certain in positions of responsibility.

The danger of such confusion is that it can lead to unproven theory being presented and accepted as irrefutable fact. This, in turn, might convince the army to structure, equip and train itself in a manner that could set up the conditions for defeat in the future. Such a defeat would very likely lead to the death or injury of many young Canadian soldiers who had entrusted their lives and future hopes in good faith to sound doctrine and professional leadership. Two of the most

dangerous beliefs that have been claimed or implied by some proponents of a misunderstood Manoeuvrist Operations/RMA doctrine are that the use of Manoeuvrist Operations:

- a. will guarantee victory. The effect that this idea has had in certain quarters is that military operations can be undertaken lightly by poorly prepared forces; and
- b. mean that an army will not actually be required to fight, other than perhaps a few skirmishes and long-range precision strikes. Such thinking is contrary to our own doctrine⁴ but this pernicious idea has tangibly affected the army.

In an earlier ADTB article⁵ I sought to highlight some of the fallacies ascribed to this Manoeuvrist Operations-RMA doctrine and to relate it to our equipment's capability to carry it out. This earlier article based its comments on theoretical operational research studies undertaken by the Operational Research Division in Ottawa. We are not, however, limited solely to theoretical analysis in our consideration of the strengths and limitations of any concept, doctrine or slogan. A study of history can also teach us lessons that permit a better understanding of our profession and its fundamental truths. I believe that consideration of the Israeli attack in the Sinai Peninsula in 1967 offers one such situation and can provide some useful insights into the validity of the two beliefs in the previous paragraph.

AIM

The aim of this paper is to draw some lessons about the application of Manoeuvrist Operations from the Israeli experience in the 1967 Sinai Campaign.

OVERVIEW OF THE SINAI CAMPAIGN IN THE SIX-DAY WAR

General

The history of Israel's unhappy relations with its Arab neighbours has filled many books and news reports, and has been the basis for numerous movies over the past 50+ years. Thus, it is likely familiar to most readers, to some degree at least. I would, however, first like to provide an overview of the 1967 Sinai Campaign to ensure a common baseline for discussion.

The 1956 Israeli-British-French-Egyptian War did not address the basic concerns of Israel and Egypt and set the stage for future fighting. Additionally, it led to:

- a. critical humiliation of the formerly dominant Middle East colonial powers, Britain and France, thus reducing external supervision of the Middle East;
- b. the first United Nations (UN) peacekeeping force; and
- c. a significant enhancement of the prestige of Egypt's leader, Gamal Nasser, and by extension of his anti-colonial and anti-Israeli stances.⁶

The 1956 war gave the Israelis eleven years of relative peace, although with continued Palestinian attacks inside Israel.⁷ These attacks created sufficient tension and uncertainty in Israel that it sought Soviet support in 1966 to have the Syrians influence the Palestinians to reduce these raids.⁸ Nasser involved himself and his army in a war in Yemen that absorbed much of his attention and his army's energy.⁸ He also became embroiled in a series of

arguments with Syria, Saudi Arabia, and Jordan. These squabbles and the Yemeni war reduced Arab unity, distracted the Egyptians from a further conflict with Israel, and reduced Nasser's prestige in the Arab world.¹⁰

The Road to War

The crisis leading up to the 1967 Arab-Israeli War is generally considered to have started on 7 April 1967 when Syrian and Israeli fighter aircraft fought a battle that cost Syria six planes.¹¹ Nasser, as a self-styled leader of the Arab world, felt the need to demonstrate Egyptian strength and his anti-Israeli credentials.¹² He may also have truly believed that Israel was planning a pre-emptive strike against Syria to stem further Palestinian raids.¹³ Thus, to demonstrate his support for Syria, on 14 May 1967 Nasser ordered the mobilization of the Egyptian military reserves and the massive reinforcement of the Sinai garrison.¹⁴ Nasser's concerns about Israeli intentions may have been heightened by Soviet information that was, perhaps purposefully, deceptive.¹⁵

Within a three-week period, the garrison of the Sinai Peninsula grew from less than two infantry divisions and some armour to over six division-size formations—two of which were armoured.¹⁶ These moves were carried out with such extensive press coverage that when Nasser realised the threat against Syria did not necessitate reinforcement of the Sinai he was trapped by his own propaganda. Nasser could not cancel the deployments without being seriously embarrassed.¹⁷

By the start of the war Nasser had taken two other actions that seriously worried the Israelis. He obtained the withdrawal of the UN force in the Sinaix¹⁸ and closed the Strait of Tiran to Israeli shipping, effectively cutting off Israel from Far Eastern oil and the Indian Ocean.¹⁹ Israeli worries were further increased by the hate-filled rhetoric flowing out of various Arab capitals and media.²⁰

Whether Nasser actually intended to attack Israel or whether he got involved in a game of brinkmanship

that went very badly wrong is not really clear. This question is less important than the fact that his actions and their consequences created great fear and a political crisis²¹ in Israel that virtually guaranteed the Israelis would attack the Egyptian Sinai garrison that was so dangerously close to vital Israeli positions.

Israel mobilized 60,000 to 70,000 reservists in mid-May in response to the Egyptian build-up. Once it had done so, Israel needed a relatively quick solution to the crisis, as its economy could not afford the absence of so many workers for any lengthy period of time²². Since Nasser would not, or could not, back down, the only solution to the crisis was war.

By 1967, the Israeli national strategy was to use pre-emptive attacks to carry any war quickly to the enemy's territory to gain depth²³ and spare Israeli cities, civilians and industry from the destruction of war.²⁴ This was necessary to avoid heavy casualties, damage to Israel's relatively sparse

between 100,000 – 400,000). The major urban area, al-Arish²⁷ on the Mediterranean coast, had a population of about 40,000 in 1967. Map 1 shows many of the features described in the following paragraphs.

The Peninsula can be thought of consisting of three sectors for military planning purposes, northern, central and southern. The northern sector along the Mediterranean coast is desert with broad expanses of sand dunes that are difficult to traverse with vehicles. Low ridges offer many opportunities for laying out defensive positions. A single poorly maintained, paved road followed the coast. This area favoured the defender.

The central sector is the most amenable to the conduct of an attack. The ground here is a mixture of hard soil and sand. However, many deep, dry watercourses (*wadis*) and steep stone hills hamper manoeuvre in this area. A mountain range runs north to south along the western side of the Peninsula near the Suez Canal. This range is

... the broad utility of Manoeuvrist Operations as a doctrine for the Caadian Army has been questiones.

infrastructure, and consequently putting a serious strain on the Israeli society. Such a strain might lead to the weakening of the Israeli social cohesion and will to fight. This cohesion and will were essential as the Israelis knew that they could not win a single decisive, lasting military victory. Rather, Israel had to keep defeating the Arab armies each time they returned for a "rematch."²⁵

Geography of the Sinai²⁶

The Sinai Peninsula is a triangular body of land between Egypt in Africa and the former Palestine (Gaza, Israel and the West Bank) in Asia. It covers 61,000 square kilometres and is about 160 kilometres wide by 280 kilometres deep. The Peninsula was essentially unpopulated in the 1950s and 1960s (population estimated at

traversed by a number of passes, notably the Mitla, Giddi and Khatmia passes. The Khatmia Pass (not shown) is to the east of Ismailia and north of the Giddi Pass on the Central Route. The only two major east-west routes to cross the Peninsula, other than the Mediterranean coastal road, were found in this sector. The Southern Route, the Pilgrim's Way, was a dirt track that ran from the Suez Canal through the Mitla Pass and on to Eilat in Israel. The Central Route was the best all-weather road in the Sinai in 1967. It runs from Ismailia on the Suez Canal, through the Khatmia Pass and then on to Israel via Bir Gifgafa and Abu Ageila.

The southern sector of the Peninsula is barren and bleak. Mountains, including Mount Sinai at 2,637 metres altitude, dominate this

half of the Peninsula. Routes in this area are unpaved and do not lend themselves to use by large mechanized forces. Thus, this half of the Sinai does not really contribute to an attacker's or defender's plan, other than by not being useful to the opponent.

The Sinai itself offers little of direct military value. It is, however, a buffer zone of significant strategic value to Egypt and Israel. Consequently, military planners need to secure the three routes through the northern and central sectors in order to control movement through the buffer zone. Progress in the 1956 Sinai Campaign had been based on the Israeli ability to secure these routes to get to the militarily and politically important Suez Canal.

Egyptian Deployment

By 5 June 1967, the evolution of the crisis meant that four Egyptian infantry divisions and two armoured division equivalents were deployed in the Sinai. Outside of the Sinai, to the northeast, in the Gaza Strip, the Egyptians had a fifth infantry division (20th Palestine).

The weight of the Sinai deployment was along, or near, the Pilgrim's Way with the two armoured divisions (4th Armoured and Shazli Force) and an infantry division (6th). An infantry division (7th) defended the southern Gaza Strip/Mediterranean coastal road. Another division (2nd Infantry) protected the eastern end of the Central

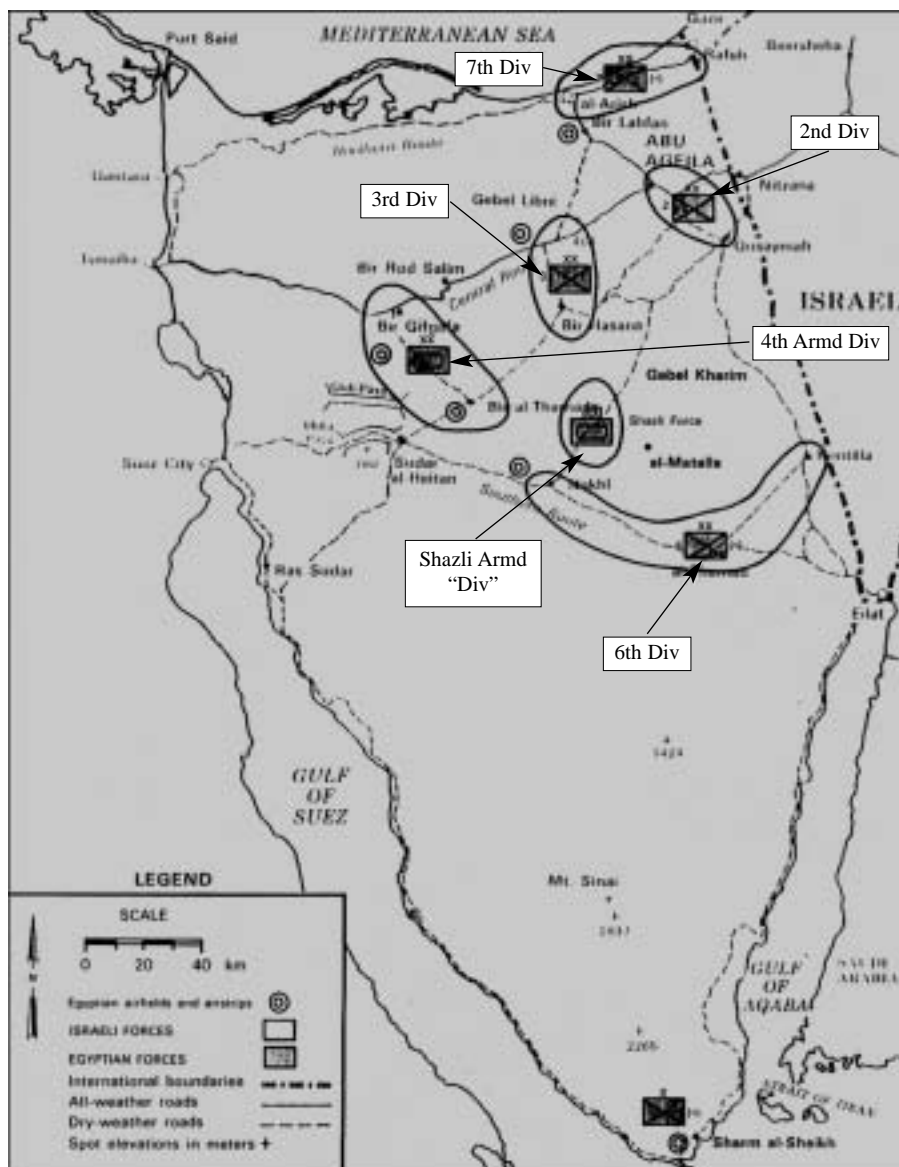
Route at Abu Ageila and Qusaymah, preventing any Israeli advance westward on the one good paved road. The final infantry division (3rd) was deployed behind the Abu Ageila/Qusaymah area on the Central Route in the Gebel Libni area.²⁸ An infantry brigade was initially deployed at Sharm al-Sheikh until water shortages forced most of the garrison to be withdrawn. See Map 1 below.

This deployment provided the Sinai garrison with a strong defensive layout covering the principal routes west to the Suez Canal. It also placed three divisions on, or near, the Southern Route in the central sector, providing the ability to carry the war to southern Israel, possibly cutting off the port of Eilat.

Egyptian Weaknesses

The process of tripling the Sinai garrison led to problems that created fundamental weaknesses in the Egyptian defence. These problems were made worse by other decisions that did not flow directly from the garrison's hurried expansion. In addition to long-standing problems of low education levels among its soldiers, a deleterious class structure and a shortage of competent regimental officers,³⁰ on the eve of the Israeli attack, the Egyptian army in the Sinai suffered from the following additional problems.³¹

- The Egyptian general staff created an extra level of command for the Sinai front on 15 May 1967 and inserted it between the Sinai field army commander and the commander-in-chief in Cairo. The front commander had responsibility for operations without the necessary authority to take appropriate independent action. The first front commander arrived in the Sinai a week before the war with only a small staff. He had little experience with the Sinai as his previous posting had been as commander of the Egyptian forces in Yemen.
- Weaknesses at the highest command level were aggravated by the change of all of the army's 12 divisional commanders and divisional chiefs of staff in the few weeks before the start of the war.



Map 1: Initial Egyptian Deployment ²⁹

As with the front commander, divisional commanders were soon to lead their formations into battle not really knowing their units, subordinate commanders and troops, or the ground.

- c. These new commanders would not even benefit from a well-established war plan for the defence of the Sinai as the existing plan was changed significantly four times in the three weeks prior to the start of the war; and
- d. The inclusion of large numbers of reservists into the existing field formations was done in a manner that undermined cohesion. By the start of the war, over half of the Egyptian army, other than the Yemeni expeditionary force, was composed of reservists. Many of the reservists were not well trained due to budget cuts and their integration was done in a manner that undermined unit integrity at the battalion level.

Israeli Readiness for Battle

General. In spite of the strategic weakness of Israel, and unlike the Egyptian army, the Israeli ground forces were well prepared for battle. This strength was based on doctrine, morale, training, air superiority, intelligence, and command and control. A brief summary of these six factors will explain the Israeli strengths and highlight some points of interest.

Doctrine. The doctrinal confusion that had existed in the Israeli army during the 1956 war about whether to base the army's force structure on infantry formations or armoured formations had been settled in favour of the latter. The Israeli armoured corps had been expanded in terms of numbers and equipment between 1956 and 1967. The entire army, led by the armoured corps, had been integrated into the national strategy of pre-emptive strike and carrying any war to the enemy's territory as quickly as possible.³²

Morale. The history of Israel from its founding, and the rhetoric emanating from various Arab media

and capitals, made it easy to see the role of the Israeli army as that of protecting the nation and civilian population from destruction. From the Egyptian soldier's viewpoint it was far less clear why he had been mobilized and sent to the Sinai. Thus, the Israelis would enter the war with the clear advantage of knowing why they were fighting.³³

Training. The Israeli army in general had maintained a high level of training. Its structure was based on the part-time citizen soldier and the concept that reserve brigades had to be able to mobilize very quickly and fight as well as regular army formations.³⁴ The reserve brigades' performance had

been improved, after some unhappy experiences during the 1956 war, by the reassignment of older (over 40) reservists from combat brigades.³⁵ These individuals were now used in second line roles. The reserve brigades mobilized in mid-May 1967 in response to Nasser's actions had benefited from two weeks of intensive training in the field to refresh their skill levels.³⁶

Air Superiority. The Israeli pre-emptive strike on the Arab air bases at the start of the war is famous. This attack quickly destroyed over 300 Arab aircraft and gave Israel air superiority. The Israeli army could subsequently call for heavy air support without facing a similar threat. Control of the air also gave the Israelis superiority in airborne reconnaissance and surveillance.

Intelligence. The Israeli forces of the 1967 campaign did not have the sophisticated technology favoured by current proponents of RMA. However, thanks to Israeli superiority in the air and other intelligence gathering assets, they were able to follow the flow of the battle. So much so that at a critical moment in the campaign the Israelis knew that the Egyptians were withdrawing in a disorderly fashion towards the Suez Canal. Israeli commanders then decided that they had the opportunity to smash the Egyptian army.³⁷

Command and Control. From its formation, the Israeli army had emphasised an informal, innovative command style, colloquially known as organised chaos,³⁸ that saw the plan as "merely a basis for change."³⁹ This style demanded that units "... stick to the 'maintenance of aim' and continue to advance until their objective is gained...."⁴⁰ The Israeli training system sought to ensure that "(A) ... commander should be so trained as to make him as little dependent on his superior as possible in deciding how to act."⁴¹ The command and control system from general HQ through geographic command, multi-brigade task force (*ugdah*), and brigade had been

... the Israeli army had emphasised an informal, innovative command style...

developed intensively between 1956 and 1967.⁴² The commander the Israeli Southern Command, Brigadier General Gavish, used a mission command style of leadership. Ugdah commanders were given general orders and then left to accomplish their mission bearing in mind the task, their forces, and their own personalities⁴³. It is claimed that the Israelis only had a plan for the first day of the campaign and that the rest was improvisation based on how the battle unfolded.⁴⁴ In 1967, the Israelis also benefited at key places and situations from the high level of trust essential to the mission command philosophy.⁴⁵

Israeli Campaign Plan

General. In support of its national strategy of pre-emptive strike, Israel planned to use three ugdahs and three independent brigades for a surprise attack into the Sinai and the Gaza Strip. An infantry brigade covered the north-eastern end of the Gaza Strip while an armoured brigade covered the southern Negev Desert. A weak infantry brigade covered the northern Negev and tied up part of the 2nd Egyptian Infantry Division around Qusaymah, south of Abu Ageila. The heart of the Israeli Southern Command's striking power was three combined arms ugdahs commanded, from south to north, by Generals Sharon, Yoffe, and Tal

respectively.⁴⁶ In order to deflect Egyptian attention from this force, the Israelis carried out a deception plan with dummy tanks to reinforce the armoured brigade in the south.⁴⁷ This effort was directed at convincing the Egyptian high command that the Israelis would attack from the southern Negev, repeating the 1956 advance to the Mitla Pass. In actual fact, the Israeli plan made the southern Sinai of minor importance in the campaign. The Israelis believed that the Strait of Tiran would be opened automatically with the defeat of Egypt's Sinai garrison.⁴⁸

Israeli Overall Plan. The campaign plan called for the defeat of the Egyptians in a three-phase operation. The first phase would be the penetration of the forward line of defences at al-Arish on the Mediterranean coast

and at Abu Ageila on the Central Route. In the second phase, Egypt's second line of defences would be destroyed around Gebel Libni, in the area of the 3rd Egyptian Infantry Division. In the final phase the Israelis planned to move rapidly to the Giddi and Mitla Passes, east of the Suez Canal, and cut off the Egyptian army.⁴⁹

Detailed Plan. In the north, the Israeli plan was for General Tal's ugdah with three brigades (two armoured [7th Armoured and Aviram's⁵⁰] and a reduced paratroop [Rafael Eitan's 202nd]) to break into the Gaza Strip at its base at Rafah and then advance westward along the Mediterranean coastal road to al-Arish. From there, it would both continue west on the coastal road and send a force into the northern central Sinai towards Gebel Libni. On the Cen-

tral Route, Sharon's ugdah with three brigades (14th Armoured, Col Adam's infantry, and 80th Para) and additional special elements was tasked to capture the Abu Ageila fortified area. Once this was completed Sharon's force was then to advance south and cut off any Egyptian retreat along the Southern Route towards the Mitla Pass. Sharon would co-operate with Col Albert's independent armoured brigade advancing on al-Thamad from the southern Negev. Yoffe's ugdah of two armoured brigades (Col Shadni's and Col Sela's) would deploy initially between Tal and Sharon. From here, these two brigades could support either ugdah in the event of trouble. Their primary purpose, though, was to push through to Gebel Libni and help Tal defeat the Egyptian 3rd Infantry and 4th Armoured Divisions in that area⁵¹. Map 2 provides a simplified presentation of the Israeli plan.

Unfolding of the Campaign⁵³

General

The actual campaign unfolded essentially as the Israelis had planned, except that the Egyptian defences initially held out more resolutely than expected. Then the entire Egyptian army collapsed, an event on which the Israelis could not plan. Map 3 shows the flow of the four days of fighting.

Events of 5 June

The Israeli air strikes on the Egyptian air bases started without warning at 07:45⁵⁴ on 5 June 1967. These attacks caught Field Marshal Amer, the Egyptian commander-in-chief, his air force chief, and G3 in the air on the way to inspect the Sinai garrison and meet all senior commanders at Bir al-Thamada. Amer's airborne presence enroute to the Sinai hampered the initial air defence response to the Israeli strikes as the Egyptians were concerned about shooting down his plane. The senior Egyptian leadership was caught out of position and took some time to get back to their command posts. Some commanders returned to their formations that evening, some 12 hours after the war began, as they did not wish to travel by daylight. In addition to creating



Map 2: Israeli Plan⁵²

physical dislocation, the air strikes had a profoundly negative effect on the morale and resolve of several key commanders. Field Marshal Amer could not bring himself to tell Nasser of the disaster and contemplated suicide.

General Tal's *ugdah* attacked the southern end of the Gaza Strip at 08:15. The lead brigade (7th Armoured) broke into the defences after a tough fight and then headed south on the coastal road towards al-Arish. Follow-on brigades had to fight their way through the bypassed Egyptian forces, employing air strikes in some cases.

General Sharon's *ugdah* started its advance towards the Abu Ageila fortified area around 08:15. The commander of the 2nd Egyptian Infantry Division, which covered Abu Ageila, did not return to his command until the end of the day. Sharon's force experienced some initial fighting east of Abu Ageila. Air strikes were required to help soften the position.

The other Israeli forces—mainly Yoffe's *ugdah*, the infantry brigade opposite Qusaymah and Col Albert's southern Negev armoured brigade—held their positions or made supporting moves. Yoffe's *ugdah* advanced an armoured brigade between Tal and Sharon, preventing any reinforcing north-south movement by the Egyptian forces. Advancing over loose sand, that the Egyptians had thought was impassable, the Israeli brigade got into a position at the Bir Lahfan crossroads where it encountered elements of an Egyptian armoured brigade and a mechanised brigade. Fighting carried on throughout the night. This action prevented the Egyptian frontier forces being reinforced from Gebel Libni.

Field Marshal Amer expected the major Israeli attack to occur in the southern Sinai along the Southern Route. Therefore, he kept large forces in that area to counter this attack. Thus, the northern Egyptian garrison forces faced the bulk of the Israeli *ugdahs* essentially unsupported in the critical early hours of the war.

By the end of 5 June, Egypt's air force was effectively destroyed and the

Egyptian command and control system was already starting to break down. The Israelis, for their part, had broken through the southern end of the Gaza Strip and were advancing on al-Arish on the Mediterranean coastal road and on Abu Ageila on the Central Route.

Events of 6 June

During the night of 5/6 June, Sharon's *ugdah* launched its assault on the Abu Ageila fortified area. The attack followed a very complex, tightly controlled plan. The Israelis had learned through difficult experience in the 1956 battle for Abu Ageila that some situations require tight control to ensure that misplaced initiative and poor co-ordination do not make a tough battle harder. This night attack involved:

- a. independent deep manoeuvre by an armoured battlegroup;
- b. heliborne infantry insertions behind the Egyptian artillery;
- c. an infantry brigade attack;
- d. an armoured advance at night to meet the infantry brigade, and
- e. the largest artillery fire plan to date in the history of the Israeli army.

The Abu Ageila position was effectively captured by 06:00.

Yoffe's second armoured brigade then pushed through the Abu Ageila position and joined his first brigade at the Bir Lahfan crossroads. Israeli air strikes and the superiority of the Israeli Centurion tanks over the Egyptian T-55s combined to turn the tide of this battle. By 10:00 the battle at Bir Lahfan was over with the Egyptians in retreat.

On the coastal road, Tal's troops captured al-Arish around 09:00. From here, Tal sent troops towards Gebel Libni to support Yoffe's *ugdah*. Other elements of Tal's force would push south down the coastal road towards the Suez Canal later.

The forces of Yoffe and Tal met at Gebel Libni where they surrounded the Egyptian garrison. Supported by air

strikes they attacked the Egyptian forces outside the Gebel Libni airfield. Elements of this force, the Egyptian tanks, withdrew west after fighting the Israelis, leaving the infantry and artillery behind. These followed soon after, their morale undermined by their abandonment. Despite these defections, the airfield itself was still strongly defended. This forced Tal's and Yoffe's brigades to spend the night refitting around the airfield.

One of the most important events of the campaign occurred at about 16:30 on 6 June when Field Marshal Amer gave way to panic.⁵⁵ It is claimed that during the campaign he issued conflicting and confusing orders⁵⁶ which effectively had the Egyptian army abandon its battle positions and run west for the Suez Canal. No phases were given for the withdrawal of a force of six divisions. The Egyptians were told "... to reach the west bank (of the canal) in one day's time."⁵⁷ This collapse at the highest levels may have been due, in part, to the shock of the early Israeli victories in the air and on the ground at Rafah and Abu Ageila. It was likely also partially a result of the realisation that the Egyptian high command had completely misread the Israeli intentions and campaign plan.

General Gavish knew from intelligence sources that the Egyptians were going to run for the Canal. Seeking to benefit from this situation, he met with his three *ugdah* commanders in the late afternoon and ordered them to break through the Egyptians and cut them off from the Suez Canal.⁵⁸ Yoffe was ordered to get tanks to the Mitla and Giddi Passes and cut off the retreating Egyptians. Tal was to follow the Central Route that ran west towards the Suez Canal.

By the end of 6 June, the Israelis had captured Abu Ageila and al-Arish and advanced to Gebel Libni on the Central Route. The Egyptian commander-in-chief had ruined any chance his army had to reverse these defeats by ordering it to "run for the Suez Canal". The Israelis were taking risks to smash their disorganised enemy.

Events of 7 June

At daybreak Yoffe's and Tal's forces captured the Gebel Libni airfield. They

then headed in separate directions to cut off the Egyptians.

Shadni's brigade of Yoffe's ugdah reached Bir Hasana by 09:00. Groups of vehicles from this brigade became intermixed with Egyptian vehicles, shooting up retreating columns as they moved westward. The brigade reached the eastern end of the Mitla Pass at 18:00 with only nine Centurion tanks, the rest of Shadni's tanks having broken down or run out of fuel. The Egyptians also had Centurion tanks and in the confusion they allowed the Israelis to take up fire positions at the entrance to the Pass without confronting them. There, Shadni's troops were able to destroy many Egyptian vehicles, assisted by the Israeli air force.

Further north, Tal's troops had to fight harder to reach the Khatmia Pass and were less successful. Battles/skirmishes were fought on the road westward towards Bir Gifgafa. In one skirmish, Tal was able to obtain badly needed fuel from Egyptian supply vehicles. At the eastern mouth of the Khatmia Pass, the Israelis became involved in a major battle with Egyptian forces coming north. Israeli losses were high in the fighting for the Khatmia Pass and the Israelis even had to endure an Egyptian air attack. Tal was unable to close the Khatmia Pass, allowing large portions of the 4th Egyptian Armoured Division to escape during the night of 7/8 June. The Israelis were even driven back from the positions that they had occupied in order to fire onto the Egyptian columns.

Early in the morning, a composite force from Tal's ugdah, built on the regular Paratroop Brigade, left Khan Yunis in the south end of the Gaza Strip, headed towards the Suez Canal along the Mediterranean coastal road. This force met little resistance until reaching the small coastal town of Romani, some 60 kilometres east of Port Said on the Suez Canal. There, the composite force refuelled and rested for the night before attacking the town the next morning.

At the eastern end of the Central Route, Sharon had rested his force for the remainder of 6 June while awaiting the capture of Qusaymah by the weak

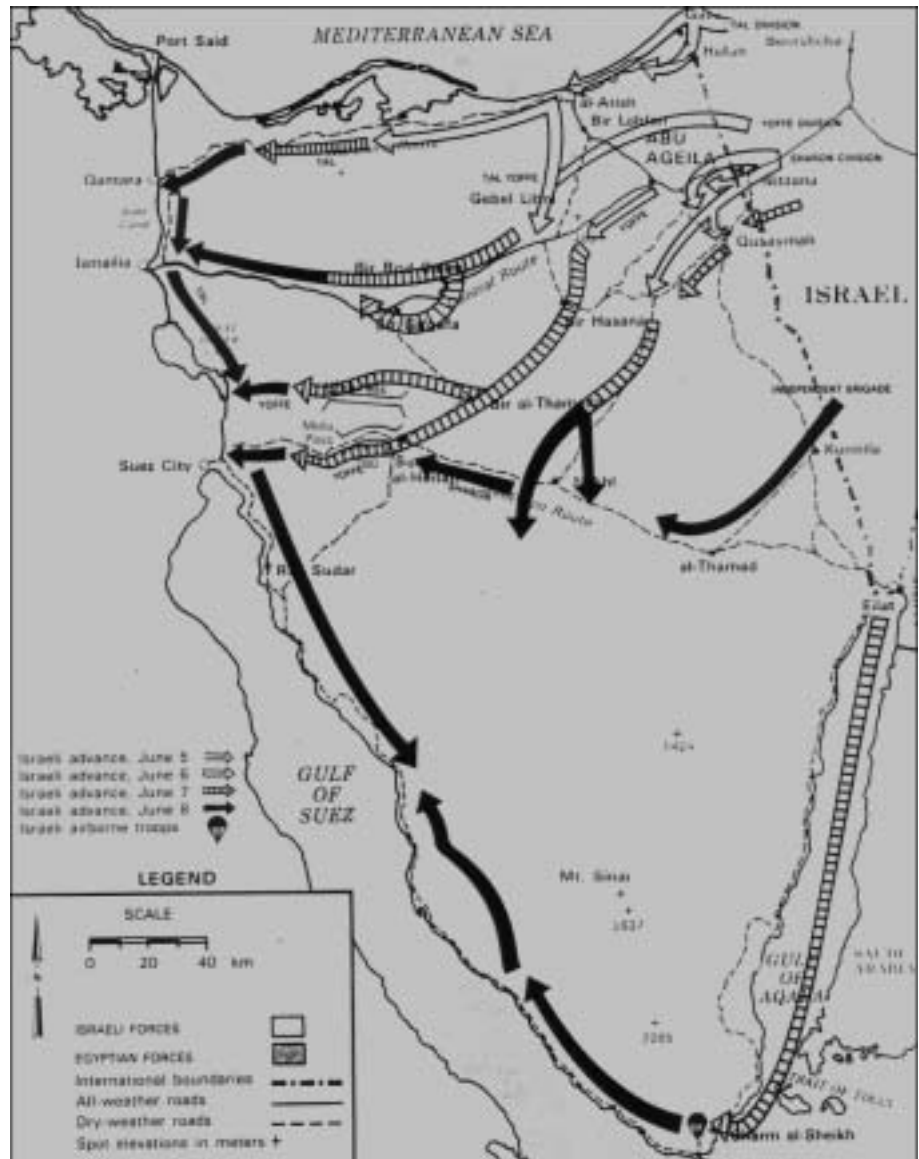
infantry brigade that had been covering it. When this brigade advanced on 7 June it discovered that the Egyptian 10th Brigade had slipped away in the dark. Then, Sharon set off with the 14th Armoured Brigade towards Nakhl on the Southern Route to find the Egyptian Shazli Force. At a long ridge, the Gebel Kharim, he ran into outposts of the 6th Egyptian Infantry Division and found that this division was still holding its defensive positions. Since it was already dark, Sharon waited until daybreak to attack.

At Sharm al-Sheikh, adjacent to the Strait of Tiran, an Israeli naval and paratroop force captured the Egyptian position on the morning of the 7th. Part of the paratroop force was then carried by helicopter in the afternoon to the western coast of the Sinai.

By the end of 7 June, the Israelis were pressing the Egyptians everywhere in the Sinai. They had strong positions at the Mitla Pass and had reached the town of Romani on the Mediterranean coastal road. Sharm al-Sheikh had fallen and Sharon's ugdah was pressing the Egyptian divisions along the Southern Route in the central sector. Despite their numerous disadvantages, many Egyptians were still making the Israelis fight for their victories. Tough fighting would be necessary to secure the eastern end of the Khatmia Pass.

Events of 8 June

On the morning of 8 June, Tal's refitted forces advanced methodically towards the Khatmia Pass aided by air



Map 3: Overview of the Campaign⁵⁹

strikes. By 16:00 the Israelis had destroyed about 40 tanks for the loss of two. The Egyptians broke off the battle and tried to escape through the Pass. There, they were delayed by a massive traffic jam and bombed and napalmed by the Israeli air force. Tal's forces were able to push through, meeting little resistance and reaching the Suez Canal early on 9 June.

The composite force on the Mediterranean coastal road attacked Romani at dawn and was able to push on towards the Suez Canal. This force was hampered by various Egyptian units and air attacks. Eitan, the force's commander and a future chief of the Israeli General Staff, was wounded in one of the skirmishes. The Israelis only reached Qantara and its railway bridge over the Suez Canal around 20:00. During this advance they were aided by more Israeli air strikes. They then had to fight the Egyptians through the night to capture the city and eastern end of the bridge by dawn on 9 June.

Shadni's brigade set off through the Mitla Pass at about dawn and reached the western end of the Pass by noon. Here, it met up with a force of Israeli paratroopers that had been

the second brigade of the 6th Egyptian Infantry Division and ambushing it. This brigade was trapped between Sharon and Albert's brigade from the southern Negev. Further, the Egyptians had been bombed by relays of Israeli aircraft ever since leaving their defensive positions. The brigade desperately and repeatedly tried to fight its way through Sharon's force but was destroyed.

By the end of 8 June the Israelis were closing up to the Suez Canal and the Strait of Tiran was open to Israeli shipping. The surviving Egyptian forces were fleeing the Sinai on foot and swimming the Suez Canal. For the Israelis, their war aims had been accomplished and they turned their strength to fighting the Jordanians and Syrians.

Aftermath

The Six-Day War ended on the Sinai front on 8 June when Egypt accepted a UN cease-fire call. It finally ended on 10 June with a UN cease-fire on the Syrian front. Bitter recriminations broke out in Egypt, as the population, fed a steady diet of victory communiqués, realised what had occurred. Nasser, by adroit manoeuvres, managed to retain power.⁶⁰ The Arab

designs and thousands of instructors to help the Egyptians to master modern warfare.⁶⁶ This permitted a major and profound rebuilding of the Egyptian army.

The Egyptians never accepted that the war was lost. They continued to fight the Israelis. Even before the Israeli-reckoned outbreak of the War of Attrition in 1969,⁶⁷ the Egyptians attacked when and how they could. Egyptian commando and artillery attacks were being carried out against the Israelis along the Suez Canal within three weeks of the end of the Six-Day War.⁶⁸ The Israeli destroyer *Eilat* was sunk off the Mediterranean coast of Egypt in October 1967.⁶⁹ Palestinian guerrilla attacks resumed immediately after the war, supporting the efforts of the regular armed forces and helping to restore Arab self respect.⁷⁰ These terrorist attacks also spread outside of Israel, bringing the Arab-Israeli conflict to peoples who had nothing to do with either party. Clearly, being defeated was not going to bring the Egyptians, or the Arabs in general, to the peace table.

At the same time, the Israelis became arrogant and complacent, failing to assess whether they had won the 1967 Sinai Campaign or whether the Egyptians had lost it. Some Israelis also came to believe that they could redraw their nation's borders in pursuit of a narrow vision of a Greater Israel.⁷¹ Another, more traumatic war six years later and the arrival of an Egyptian president ready to risk assassination and domestic turmoil⁷² were needed before Israel was able to achieve even a "cold peace" with Egypt.

LESSONS FOR THE CANADIAN ARMY

General. Some may challenge the relevance of the 1967 Sinai Campaign to Manoeuvrist Operations and armies benefiting from the revolution in military affairs. Clearly, the Israelis did not have the panoply of high tech, computer-based equipment so beloved of RMA enthusiasts. However, such tools are only a means to an end. Further, it is not the possession of such tools that is most important in "RMA-warfare" but rather the relative dominance in their use over the enemy.

Some may challenge the relevance of the 1967 Sinai Campaign to Manoeuvrist Operations...

landed in blocking positions. These forces reached the Suez Canal about two hours after Tal's troops on 9 June.

Yoffe's second brigade (Sela's) raced to the Giddi Pass to cut off the escape of the Egyptian forces headed that way. This brigade got into a fight with an Egyptian T-55 battalion. Here again, the superiority of the Centurion over the T-55 shone through. By 19:00 the Israelis had fought their way through the Pass, aided by heavy air strikes. From here, they moved to the Suez Canal and spread out along its eastern bank.

In the south central Sinai, when Sharon advanced against the Gebel Kharim position he discovered that the Egyptians had withdrawn once again. Sharon pushed on to Nakhl, cutting off

world was swept by a wave of fierce rage against Israel, and the United Kingdom and United States.⁶¹

Wholesale court-martials were undertaken against Egyptian officers who had, or were said to have, failed in their duty.⁶² In order to avoid such a fate, Field Marshal Amer, expecting to be the scapegoat for the disaster, committed suicide.⁶³ New senior officers were appointed to rebuild the Egyptian army and the old class structure was broken up by granting officer commissions to competent individuals of humbler birth.⁶⁴

Within a relatively short time the Soviet Union had replaced 70% of the equipment lost in the war.⁶⁵ The Soviets also provided equipment of newer

In 1967, the Israelis had a clear technical superiority over the Egyptians, particularly after the Egyptian air force had been destroyed. The air superiority gained by this destruction allowed the Israelis to carry out deep strikes against Egyptian formations and facilities that were far from the front lines. Additionally, General Gavish's eavesdropping of the lower level Israeli tactical command radio nets, and the use of most of his staff as "eyes and ears" with his forward formations, gave him a situational awareness somewhat similar to what digital command and control systems are trying to provide. His methods even allowed him to correct confusion at the brigade level.⁷³ I believe that the campaign offers lessons that we slough off at our peril.

Utility of Manoeuvrist Operations.

The first obvious lesson from the campaign is that Manoeuvrist Operations can work. In four days, an Israeli force of 10 brigades, supported by overwhelming air power, routed a defending force roughly twice its strength and benefiting from strong positions. It did this without ever having to engage over half of the Egyptian force in major operations.⁷⁴ The Egyptian army lost 80% of its equipment in the Sinai and suffered over 55,000 casualties.⁷⁵ Having fought through the Egyptian forward defences and realising that the Egyptian morale had collapsed at the highest command levels, the Israelis were able to advance through the Egyptians, completing their rout. It can be argued that the Egyptian army was not defeated in the Sinai but rather that its commander-in-chief, Field Marshal Amer, was overwhelmed by events and that his morale and ability to command were destroyed; exactly what Manoeuvrist Operations seek to accomplish.

Risk of Casualties. The second lesson is that Manoeuvrist Operations are not a magic recipe to avoid casualties. In four days of fighting the Israelis lost some 300 dead and 1,100 other casualties in the Sinai Campaign, about a 2% casualty rate. Most of these losses occurred in the early break-in battles when the Egyptians fought well and benefited from their prepared defences.⁷⁶ These losses were tiny compared to those of the Egyptians and

what was accomplished. However, one cannot assume that the Canadian people and the Army are ready for similar numbers of casualties, other than in a conflict involving a national interest perceived as vital by the Canadian population and government.

Need for Traditional Combat Capabilities. The third lesson flows directly from the second. Most of the Israeli losses were suffered in the early break-in battles. Some in the Canadian army have argued that modern war does not actually require fighting. In effect, they have argued that RMA, an all-seeing intelligence system and Manoeuvrist Operations will protect us from the "tedious" business of fighting. Such a course of events in war is obviously to be desired. However, armies that build themselves based on wishes and ignoring unpalatable things are frequently defeated when they finally get involved in a war. Thus, the lesson is that, while preparing for a high tech, Manoeuvrist Operations type of war, the Canadian Army must be prepared to carry out combat operations of the more traditional types, including direct assaults on the terrain the enemy considers very important or his centre of gravity, such as natural/man-made fortified areas and urban complexes

Value of Strategy/Doctrine. The fourth lesson is what can be achieved when a nation and its armed forces develop a valid strategy and use it wisely. The Israelis developed a strategy of preemptive attack and carrying the war to the enemy's territory quickly. Their armed forces, particularly the air force and army, were developed to implement such a war. Equipment, training, force structure and planning were driven by the strategy's requirements. This focus led to a stunning Israeli victory. The Canadian Army faces different circumstances than those faced by the Israelis in the 1960s. However, the same requirement exists to build a coherent army that is able to carry out the missions assigned by its government. It has been argued elsewhere⁷⁷ that the Canadian Army is not buying equipment that meets the requirements of its Manoeuvrist Operations doctrine. Further, a senior Canadian army officer was recently

overheard to comment that the Army is neither teaching nor using Manoeuvrist Operations.⁷⁸ If we do not equip for, teach or employ Manoeuvrist Operations, it is unlikely that we will reap their benefits.

The Influence of Luck and Random Factors. The fifth lesson is that conflict is not a structured activity regulated by immutable scientific rules. Rather, it is a struggle between opposing human wills. Thus, all of the results of an action or plan cannot be predicted. At best, one can try to identify likely outcomes and trends. No one can be sure if fuel trucks will be captured or lost, whether units will attack bravely and effectively or fumble in disorder, when units will get lost or misunderstand their orders, etc. Preparing for conflict does not lend itself fully to the discipline and skills of the accountant and efficiency expert. Such skills are important to developing and sustaining an army, however, the friction of war means everything will not go as you wish or plan. All armies and military plans must contain a depth of reserves and flexibility of decision making to cater for the unexpected. No doctrine can alter this basic fact; at best, it can seek to mitigate the effects of confusion and enemy action.

Limits of Manoeuvrist Operations.

The final lesson is that while Manoeuvrist Operations won an astounding victory for the Israelis in 1967, they did not bring peace. Military operations are not a substitute for diplomacy and statesmanship at the highest levels. To paraphrase Clausewitz, they are simply an extension of politics by other means, not a panacea.

CONCLUDING COMMENTS

The Israeli experience in the Sinai shows the promise of Manoeuvrist Operations and highlights some lessons about them. The Canadian Army should learn from these lessons in support of its own application of this doctrine. Doing otherwise would be to ignore a warning offered by history and possibly to place our own troops needlessly at risk in some future conflict.



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ENDNOTES

1. Canadian Government, B-GL-300-000/FP-000 (CFP 300), *Canada's Army – We Stand on Guard for Thee*, Canadian Government Publications, 1998.
2. See Canadian Government, B-GL-300-001/FP-000 (CFP 300[1]), *Conduct of Land Operations – Operational Level Doctrine for the Canadian Army*, as found on the Defence Intranet, 2000 and the Canadian Army Lessons Learned Centre's Dispatches (Vol. 5, No. 1) devoted to Manoeuvrist Approach to Operations.
3. See for example *Misunderstanding Mars and Minerva: The Canadian Army's Failure to Define an Operational Doctrine*, LCol Hope, ADTB Vol. 4, No. 4., pp. 16 to 35.
4. Among other references see *Canada's Army*, pp. 101, 102 and 114.
5. Major L. Mader, *Manoeuvrist Operations: Some Thoughts on Whether We Have Got It Right*, ADTB Vol. 3, No. 4/Vol. 4, No. 1., pp. 50 to 53.
6. See J.N. Westwood, *The History of the Middle East Wars*, Toronto: Royce Publications, 1984, pp. 64 to 66.
7. See John Laffin, *The Israeli Army in the Middle East Wars 1948 – 73*, London: Osprey Publishing, 1982, p. 14.
8. See *The History of the Middle East Wars*, p. 82.
9. See *ibid.*, pp. 69 to 71, and Dr. George W. Gawrych, Combat Studies Institute Research Survey No. 7 *Key to the Sinai: The Battles for Abu Ageila in the 1956 and 1967 Arab-Israeli Wars* (hereafter *Key to the Sinai*), Fort Leavenworth Kansas: U.S. Army Command and General Staff College, p. 75.
10. See *The History of the Middle East Wars*, pp. 82 to 83, and *Key to the Sinai*, p. 75.
11. See A.J. Barker, *Six Day War*, New York: Random House, 1974, p. 10, *Key to the Sinai*, p. 74, and *The History of the Middle East Wars*, p. 82.
12. See *Key to the Sinai*, p. 75.
13. See *Six Day War*, p. 10.
14. See *Key to the Sinai*, p. 75.
15. See *Six Day War*, p. 11, and *The History of the Middle East Wars*, p. 82.
16. See *Six Day War*, p. 13, and *Key to the Sinai*, p. 75.
17. See *Key to the Sinai*, p. 75.
18. See *Six Day War*, pp. 13 and 14.
19. See *Six Day War*, pp. 15 to 19, and *Key to the Sinai*, p. 76.
20. See *Six Day War*, pp. 18 and 19, and Bernard Michal, *Les guerres israélo-arabes Volume 3*, Geneva: Editions Farnot, 1975, pp. 108 and 109.
21. See *Les guerres israélo-arabes Volume 3*, pp. 115 to 120, and *Six Day War*, pp. 18 to 21.
22. See *Six Day War*, p. 33.
23. Israel in 1967 had a ratio of only 13 square miles of territory to each mile of frontier. John D. Burt, *Organized Chaos Israeli Defense Doctrine and Tactics*, Strategy and Tactics Magazine Number 168 (hereafter *Organized Chaos*), Lancaster: Decision Games, 1994, p. 12.
24. See *Six Day War*, p. 31, *The Israeli Army in the Middle East Wars 1948 - 73*, pp. 3, 14 and 15, *Key to the Sinai*, pp. 67 to 69, and *Organised Chaos*, p. 14.
25. See *Organized Chaos*, p. 14 for an expansion of this idea as well as *The Israeli Army in the Middle East Wars 1948 – 73*, p. 3.
26. This section is a synthesis of information found in *Key to the Sinai*, pp. 3 to 6.
27. Numerous spellings can be found for the names of places in the Sinai. In order to simplify matters, and where relevant, I have used the spellings shown on the accompanying maps.
28. See *Six Day War*, p. 75 and *Key to the Sinai*, p. 79.
29. Extracted from *Key to the Sinai*, p. 79.
30. See John Keegan, *World Armies Second Edition*, Detroit: Gale Research

- Company, 1983, p. 169, *Six Day War*, p. 43, and *The History of the Middle East Wars*, pp. 64 and 113.
31. See *Key to the Sinai*, pp. 76 to 80.
32. See *ibid.*, p. 125.
33. See *The History of the Middle East Wars*, p. 26.
34. *Ibid.*
35. See *Key to the Sinai*, p. 72.
36. See *ibid.*, p. 91.
37. See Martin van Creveld, *Command in War*, London: Harvard University Press, 1985, p. 201.
38. See *ibid.*, p. 198.
39. See *Key to the Sinai*, p. 71.
40. See *Command in War*, p. 196.
41. See *ibid.*, p. 198.
42. See *ibid.*, p. 198, and *Key to the Sinai*, pp. 70 to 71.
43. See *Command in War*, pp. 198 to 201.
44. See *ibid.*, p. 200.
45. See *Key to the Sinai*, pp. 97 to 98.
46. See *The History of the Middle East Wars*, p. 87, *Key to the Sinai*, p. 93, and *Six Day War*, p. 79.
47. See *Key to the Sinai*, p. 78, and *Six Day War*, p. 77.
48. See *Six Day War*, p. 78.
49. See *Key to the Sinai*, p. 88.
50. Sources are quite vague about the identification of Israeli brigades and battalions. Where known, their formal names are given. If this is not possible, the name of their commander is used, if known. In some cases, neither the names of some brigades nor that of their commanders are known.
51. This force structure is developed from the often contradictory information in *Key to the Sinai*, pp. 88 to 92 and 96, *The History of the Middle East Wars*, p. 87, *The Israeli Army in the Middle East Wars 1948 - 73*, p. 16, Katz Samuel M., *Israeli Elite Units Since 1948*, London: Osprey Publishing, 1988, p. 14, and Israeli Defence Force (IDF) website as of 7 December 2001.
52. Extracted from *Key to the Sinai*, p. 89.
53. This description of the events of the Sinai Campaign is a synthesis of the sometimes contradictory text in *Key to the Sinai*, pp. 99 to 127, *The History of the Middle East Wars*, pp. 85 to 95, *Six Day War*, pp. 60 to 65 and 75 to 101, *The Israeli Army in the Middle East Wars 1948 - 73*, pp. 16 to 18, *Les guerres israélo-arabes*, Volume 3, pp. 149 to 214, *Israeli Elite Units Since 1948*, pp. 14 to 15, and the IDF web site as of 07 December 2001. Except where considered important, endnotes will not be given for each fact cited.
54. All timings cited are Israeli time, which was one hour earlier than Egyptian time.
55. See *Key to the Sinai*, p. 118.
56. See *The History of the Middle East Wars*, p. 91.
57. See *Key to the Sinai*, p. 118.
58. See *Command in War*, p. 201.
59. Extracted from *Key to the Sinai*, p. 119.
60. See *Six Day War*, pp. 148 to 152.
61. See *ibid.*, pp. 152 to 153.
62. See *The History of the Middle East Wars*, p. 113.
63. See *ibid.*, p. 91.
64. See *ibid.*, p. 113.
65. See *The Israeli Army in the Middle East Wars 1948 - 73*, p. 20.
66. See *The History of the Middle East Wars*, pp. 115 and 116.
67. See *The Israeli Army in the Middle East Wars 1948 - 73*, p. 21.
68. See *Israeli Elite Units Since 1948*, p. 17.
69. See *The History of the Middle East Wars*, p. 116.
70. See *Six Day War*, p. 159, and *Israeli Elite Units Since 1948*, p. 15.
71. See *The History of the Middle East Wars*, p. 110.
72. See *World Armies Second Edition*, p. 173.
73. See *Command in War*, pp. 199 to 200.
74. See *Key to the Sinai*, p. 126. The Israelis did not have to fight any major engagements against the two Egyptian armoured divisions, an infantry division and an infantry brigade.
75. See *The History of the Middle East Wars*, p. 95, and *Six Day War*, p. 100.
76. See *The History of the Middle East Wars*, p. 88, *Six Day War*, p. 100, and *Key to the Sinai*, p. 70.
77. *Manoeuvrist Operations: Some Thoughts on Whether We Have Got It Right*, ADTB Vol. 3, No. 4/Vol. 4, No. 1.
78. This comment was made as part of a privileged platform and is therefore not attributed here.

The Liberation of Groningen – An Urban Battlefield

by Ralph Dykstra

The crossing of the Rhine by the Allied forces in the last week of March 1945 was the last major barrier to the heart of Germany. The German army in the West had been handed a major defeat in the Rhineland in which the Canadian forces had played a major role and suffered appalling losses. Canadian casualties numbered 379 officers and 4,925 other ranks, a heavy loss indeed.¹ It was, therefore, with a sense of relief, euphoria even, that the Canadians left the Reichswald area and crossed over the Rhine. March 1945 was an important milestone for Canada, in that, for the first time in the war, all Canadian troops in the field were brought together under the overall command of General H.D.G. Crerar. LGen C. Foulkes' 1st Canadian Corps had arrived from Italy and together with LGen G.G. Simond's 2nd Corps fought side by side for the remainder of the war.

The II Canadian Army Corps moved up from the Rhine bridgehead with the 2nd Canadian Infantry Division, MGen A.B. Matthews commanding, aiming towards *Groningen*. To their left, the 3rd Infantry Division moved towards the province of Friesland while on their right the 4th Armoured Division moved along the Dutch-German border towards Delden. Simonds had ordered this division to swing east towards Oldenburg, Germany, so in the resulting gap between the 3rd and 4th Division, he inserted the 1st Polish Armoured Division that had rejoined the 2nd Corps on April 8.

The 2nd Canadian Infantry Division was given the task to clear the approaches to Groningen and capture that city. They found a city that had been transformed into a fortified stronghold. From April 12-16 the

Canadians fought their way into the city, captured over 5,000 of the enemy and suffered 209 casualties, of whom 43 were fatal. Among the population of 150,000 citizens, 110 lost their lives.

The German army in the West had been handed a major defeat...

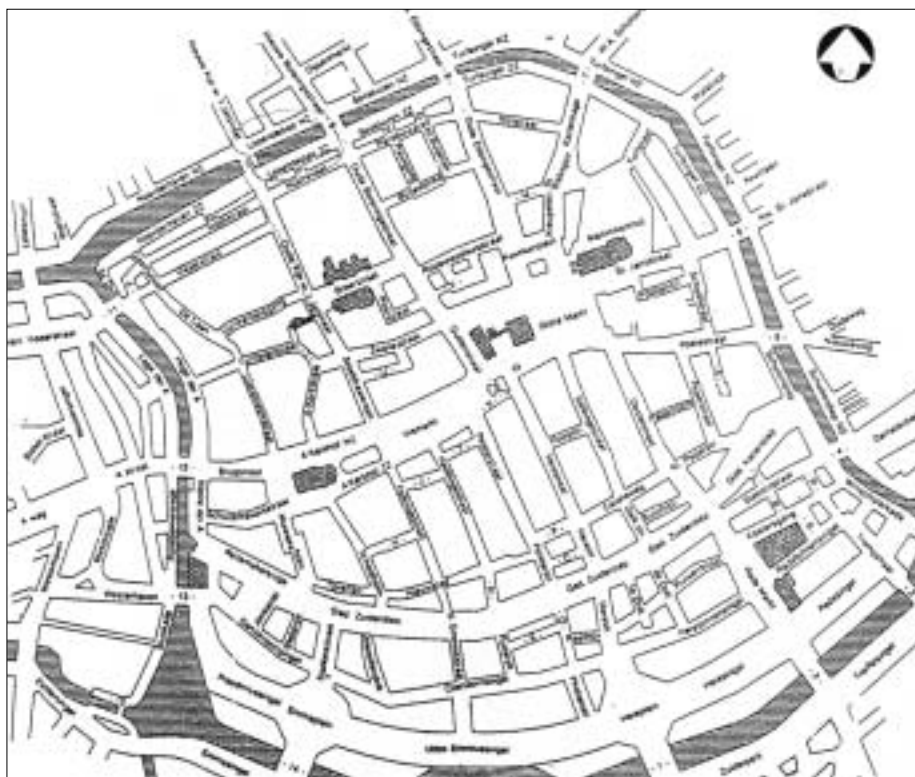
It is my intention in this paper to discuss a few important aspects of this battle that were peculiar to the city of Groningen and that affected the way in which the battle was fought.

The city of Groningen, capital of the province by the same name, is an old Hansiatic, medieval university town with a normal population of 124,000 in 1940. In April 1945, the population had swollen to well over 150,000 due to thousands of refugees from the southern provinces where the Allied forces had been fighting since September 1944.

The city, then as well as now, is composed of an inner city that was built in the late medieval period. Most of the streets were narrow, barely wide enough for one-way traffic and lined with high-density 3-5 story brick apartment flats and buildings on a 15th and 16th century street pattern. The inner city is completely enclosed by a wide ring canal. Access to the city proper, could only be gained by 12 bridges, three on each geographical side. Of course, in April 1945 many of these bridges were either destroyed by the Germans or simply raised in order to make them inoperative. Several canals entered the city both from the south and from the west, some of which lay in the path of the Canadian advance and needed to be crossed to gain entry into the city proper. Along with the suburbs built in later times outside the ring canal, the soldiers



A depiction of the final operations in the Netherlands and Germany from March to May 1945. (Courtesy Directorate of History and Heritage)



The City of Groningen as it appeared in 1945.

of the 2nd Division faced a geographical area of approximately 4.5 kms west to east and 3 kms south to north.

A large railway station dominated the southern approaches to the city. A municipal hospital and an electrical power station were located at the eastern boundary while a natural gas power station was located at the northeastern part of the city. Two large municipal parks, both of which were heavily defended, dominated both the southern and western approaches into the city. Throughout the city a number of water towers as well as several tall factories and church spires gave the enemy an excellent view of the battlefield and caused the Canadians no small amount of grief as they were under constant fire from the machine gun nests located in these structures.

Of all the types of battlefields in which an army may find itself, urban areas are, by far, the most difficult. The characteristics of an urban battlefield impinge in a number of important ways on how a battle is fought.

1. Small operational units. The pattern of close-set buildings and narrow streets cause military

operations to break into small units of troops, fighting for specific targets. Urban warfare is fought by sections and platoons rather than brigades and divisions and the initiative of the junior NCO or soldier often determines the outcome of a battle. Building complexes become defensive positions and the battle disintegrates into a series of separate and isolated conflicts around large buildings, parks, bridges, railroads and important street junctions.² This was the case in the initial attack on Groningen on Friday night, 13 April, when only one battalion was engaged to enter the city from the southwest and then broke into smaller groups to fight a dispersed enemy.

2. Close-range weaponry. Because the proximity of buildings and houses often obstructs visibility, weapon ranges are necessarily short, usually no more than one hundred feet. They are too short for the safe operation of heavy weapons and confine the fighting to hand-held or hand-thrown infantry missiles.³ The battle for Groningen was

primarily fought with rifle, hand grenade and machine gun. Supporting fire came from the 17-pounder tank guns that were particularly effective in eliminating the danger emanating from machine gun nests located in water towers and tall buildings.

3. The presence of civilians. The large civilian population precludes extensive use of artillery support in an urban battlefield and the infantry must clear each street house by house. In Groningen this procedure was made easier by the fact that the Canadians knew that they were in a friendly city. Consequently, they would politely knock on a door and question the residents to ascertain whether or not there were Germans in the house.⁴ It should be pointed out that, where Germans were found, many were more than willing to surrender to the first available Canadian. Unless there was SS troops present to spur them on, the regular German soldier had no stomach left for organized resistance. Notwithstanding the above, a small number of "civilians" were captured who had been caught sniping at Canadian troops. They turned out to be Dutch SS troops who had changed their uniforms into civilian clothing.⁵

One of the most intriguing features of the battle was the deep need for the civilian population to greet their liberators as quickly as possible. Often they would come out of their hiding places in the midst of battle to welcome the Canadians with cookies and coffee and hang out the national flag. Sometimes this would have dire consequences and led to unnecessary casualties among the citizens when the Germans counter-attacked. Still it did not deter them. In photo after photo it can be seen that the enthusiasm of the civilians to greet their liberators knew no bounds.

4. Defensive bias. One of the characteristic features of an urban battlefield is that it is a defensive terrain. The sheer complexity of the network of roads, passages,



Canadian Highland soldiers in Groningen. Note the large number of civilians in proximity to the fighting troops.

squares, water barriers and bridges favour the defenders who are fully familiar with the area and have ample time to build defence works around and in the city. To the east the Germans had inundated the low-lying area beyond another canal, which ran south to north. Since September, 1944, the Germans had forced all males between 16 and 60 to build a vast network of trenches, anti-tank ditches, weapon pits along the canal banks, bunkers covering the main bridges and a trench system between the two main roads to the south of the city. Aerial photos revealed that these defensive works made Groningen a veritable fortress that would, in all likelihood, be heavily defended. What was not known was the fact that on April 5, just one week before the 2nd Canadian Division arrived, the German 480th Infantry Division, had left Groningen by train, presumably for Germany. The remaining troops were too few to take proper advantage of this defensive belt around the city.

The above factors influenced the four-day battle fought by the 2nd Canadian infantry Division to liberate Groningen. MGen A.B. Matthews gave

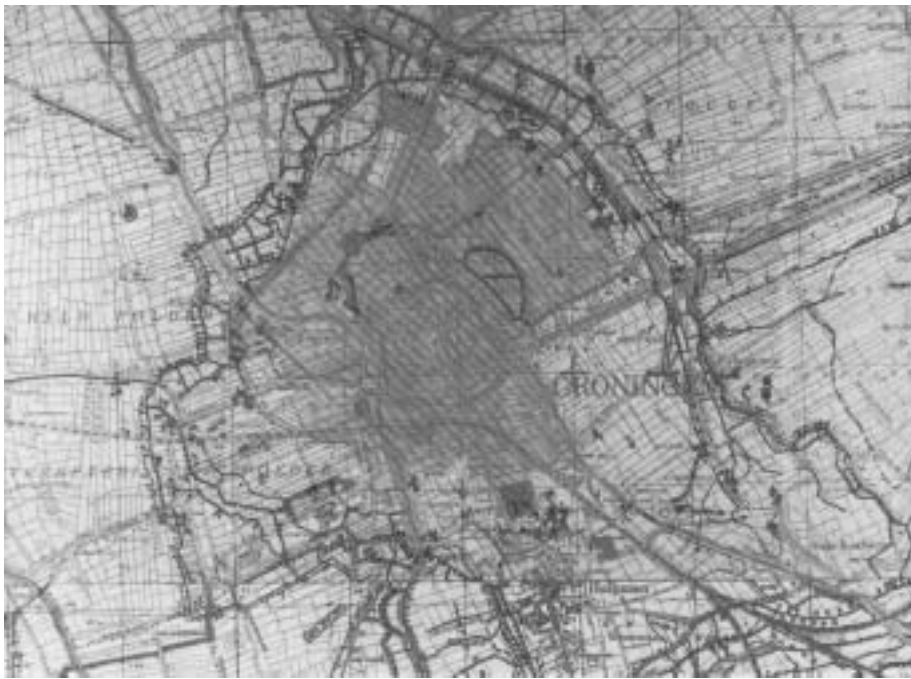
instructions to neither use airpower nor employ heavy artillery in support of the infantry as they penetrated into the city. This was partly due to concern for a swollen civilian population of a friendly city, but also to the recognition that the deployment of such weapons in an urban battlefield would not be practical. Consequently, the only significant use of the 25-pounders of 4th, 5th and 6th Field Regiments was directed over the city at the defence works along the eastern border of Groningen so as to prevent the enemy from escaping towards Delfzijl and from there to Germany. Needless to say, the decision not to use heavy armaments did not make it any easier for the infantry to advance in the face of a surprisingly determined enemy. The total number of enemy troops will never be known exactly but the most recent research indicates from 7000 to 7500 men. They consisted mainly out of elements of the *Wehrmacht*, *Luftwaffe* and *Kriegsmarine* formations. In addition, there

were German and Dutch SS units, members of the *Hitlerjugend*, German railway personnel, German garrison troops and finally units of the *Sicherheitsdienst* whose headquarters for the Northern provinces during the occupation was located in *Groningen*. Although the enemy had no tanks, they had an abundance of *Pantzerfausts* as well as approximately 20 single-, twin- and four-barrelled 20mm flak in addition to a large number of medium and heavy machine guns including the MG-42, an air-cooled machine gun that caused the Canadians considerable problems. It will be appreciated that these weapons were ideal in urban warfare. By placing these weapons at strategic communication nodes such as bridges and major intersections, the enemy was able to put up a spirited defence and delay the advance of the Canadian infantry.

Although, at first glance, it appears as if the German forces in Groningen were a motley group. It was not unusual for the German Command to form army units in this manner. If circumstances demanded it, divisional units would often be assigned to tasks



Happy to be liberated. The citizens of Groningen readily expressed their pleasure with the arrival of Canadian troops.



The complexity of the terrain in and around Groningen is evident in this map.

not originally intended. Already, early on in the war, the German command allowed for air force personnel to look after air defences. Since the city lay directly on the flight path of the allied bombers on their way to Emden, Bremen and Hamburg, the presence of air force troops in Groningen was not at all unusual. The presence of naval personnel was also natural, for the province was, in all respects, a coastal province where the Navy played a major role in its defence. The presence of SS troops was a normal occurrence. The SS was the uniformed element of the Nazi Party and was present everywhere where German authority held sway. In many ways they were the glue that held the German fighting machine together. They were the faithful who would fight on against impossible odds and almost certain death.⁶ It is they who gave the German defenders in Groningen the will and the determination to fight on to the bitter end. This is evidenced by the fact that where the SS was not present in the fighting, the enemy would more readily surrender.

The defence of the city of Groningen must be seen in the larger context of the vast defence system that the Germans had built in the north-eastern part of the province and formed the northernmost part of the WESTWALL that Hitler ordered built

in September, 1944. The entire sector from Emden, Germany to the city of Groningen was one vast flak area with Groningen forming the outermost western point. In this belt, 21 flak batteries operated on the German side around Emden. The Dutch countryside was dotted with flak batteries including two batteries at the eastern edge of the city. In addition, the island of Borkum, just off the coast in the North Sea was a self-sustained fortress with 12 fully manned flak and navy batteries varying in size from 8.8 to 28 cm.⁷ I mention these facts because invariably the question arises why the Canadian command decided to attack Groningen in a frontal assault rather than masking the city. Hindsight is perfect vision. Although the Allies knew the end of the war was near, no one knew how close the collapse of the armed forces of the Third Reich was. The

city of Groningen was part of that defensive network between Emden, Delfzijl and Groningen. Thousands of German troops and Nazi sympathizers were steadily moving from the west across the IJsselmeer causeway towards Delfzijl where they might escape across the Eems to their homeland. It must also be remembered that the 4.5 million people of the western part of Netherland had been cut off from all food supplies since the Market Garden operations and were rapidly nearing the point of total starvation. Since the northern provinces were the food basket of the west, it was essential that these provinces be cleared of the enemy as quickly as possible. Finally, it should be pointed out that although the major military objective was always to defeat the enemy, in a country such as Netherland, which was an ally, not an enemy, the necessity to liberate 150,000 civilians from their oppressors played a role in military decision making.

The 2nd Canadian Infantry Division had a total compliment of 18,347 troops of whom 56% were fighting troops and 44% services. For



A sketch depicting the defensive layout of Groningen and surrounding area.



Aerial view of a portion of the battle area.

the battle of Groningen they were strengthened by 50 medium Sherman and a number of light Stuart tanks of the Fort Garry Horse. The 25-pounders of the 4th, 5th and 6th Field Regiments were set up south of the city at Eelde approximately 10 kms away. Together with the Bren light machine gun, the Vickers medium machine gun, the mortars, the 6-pounder anti-tank guns and the Piats that each battalion carried, the 2nd Division was a formidable force that confronted the enemy in Groningen.⁸

For the sake of brevity, the battle for Groningen may be divided into three phases: the approach phase, the break-in phase and the consolidation phase. The approach phase began on Friday afternoon with the advance of one battalion, the Royal Hamilton Light Infantry of the 4th Brigade, riding on the tanks of the Fort Garry Horse, along one of the two southern approaches. It was not difficult to breach the defence works, but the

battalion came under heavy fire from a large fortified municipal park and a sugar beet factory and from the houses lining the street. In the early morning of Saturday they received help from their sister battalion, the Royal

It became obvious to the Canadian command that a determined enemy required a stronger and a different approach...

Regiment of Canada, to take an all important bridge; however, it took the entire day before the Rileys reached their objective, the ring canal, where they were withdrawn with heavy casualties including 11 dead. The regimental history of the RHLI describes the fighting as follows:

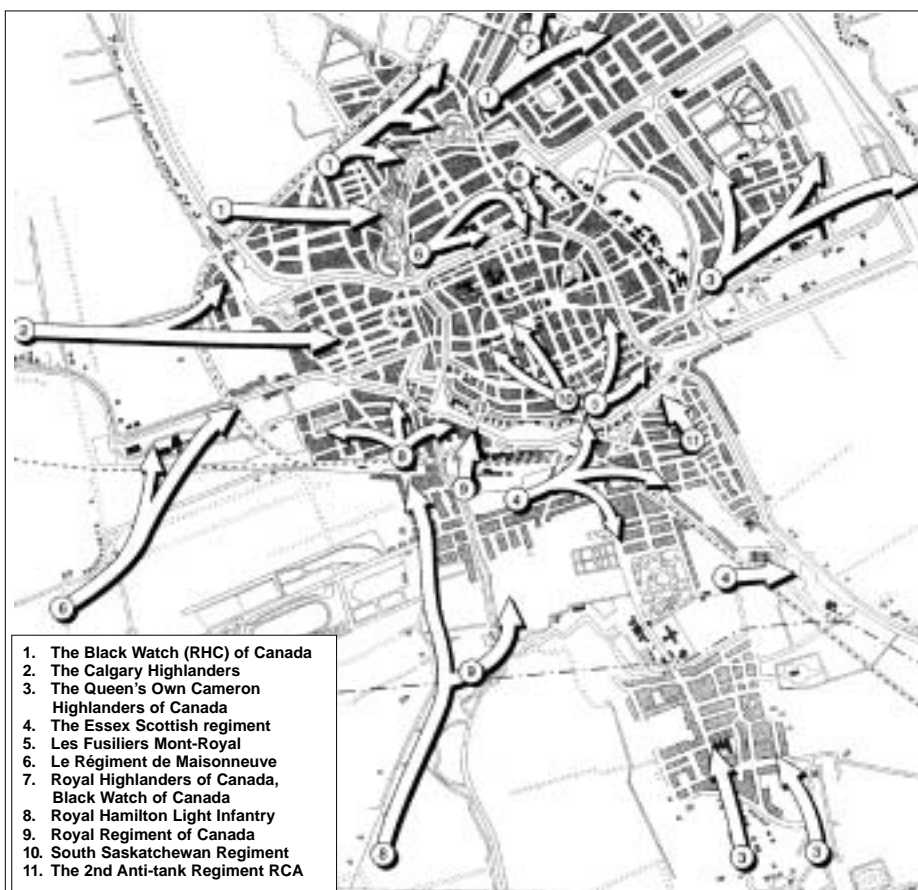
In Groningen itself, four-barreled 20mm flak guns being used in a ground fighting role slowed A Company's advance so much that D

company, with carriers in support, had to make a diversionary assault on the west end of the city before A could get a foothold... More than a hundred prisoners were taken in the house fighting which was sometimes peculiarly vicious and well sustained. Ben Holt, commanding C Company, suffered his third wound of the campaign as the Rileys fought their way into town. Although the German position was now becoming desperate, there were still men on both sides willing to take extreme risks. A platoon of A Company took a large number of casualties from small arms fire from one house, leaving the remainder very vulnerable to a counter-attack. Lance Corporal Wilf King volunteered to go back to company headquarters for reinforcements and medical supplies and sprinted down the street under heavy fire, with ricochets whistling off the walls about him. It was worth an immediate MM.⁹

It became obvious to the Canadian command that a determined enemy required a stronger and a different approach to break into the inner city. Consequently, on Saturday morning, two battalions of the 5th Brigade, the Black Watch of Canada and the Calgary Highlanders, were sent in a north-westerly direction around the city so as to penetrate the western and northern suburbs while the French-Canadian Le Régiment de Maisonneuve moved

towards the sugar beet factory to drive the enemy from that location. A report on the capture of this factory reveals the type of urban warfare the Canadian troops were engaged in as well as the initiative of Captain Jean R. Beauchemin, commanding officer of C Company of Le Régiment de Maisonneuve:

... the going was very rough, the ground we were advancing was flat with numerous little canals, so I



A sketch of the routes into the city taken by various Canadian units.

used and pooled all my 2 inches mortars and smoked my advancing Platoon commanded by Lieutenant Charbonneau (a very brave officer) he advanced about 500 yards and was unable to move one inch with his platoon. At the same time another company of our unit and another Battalion were supposed to clean and the factory and the other side of the railway bridge but no sign of them. So, my company was an easy target for the Germans overlooking us from the houses of Groningen. Then my first thought was to save this Platoon from a sure death. . . . The factory not being cleaned we were sitting ducks. So, I changed my whole plan of attack and decided firstly clean the factory. Leading the remnant of my company we crawled to the canal leading to the metallic road opposite the factory but before being able to reach the road we had many open gaps to cross and it became a mad dash and run against the German guns (by the way the Germans were sniping at us with 20

millimeters guns and machine guns and using loads of tracers), we succeeded to reach one side of the road without one man wounded or killed. . . .[author's ellipsis mark]



The railway area cleared by 6 Brigade.

Now the next problem was to dash across the road, the first man Corporal Doyon had his head shot away . . . for the men's morale I dashed across and one of my leg paralysed near the knee and have to crawl slowly so my batman Paquine, ran to my rescue pulling me to the other side. . . .

Near the factory there was no danger because they were not able to aim at us. I looked at this huge factory and knew it was almost an impossibility to clean it floor by floor. So, I decide to clean the first floor and the basement and set fire in the "kellar" and smoked them out. The trick worked . . . [author's ellipsis mark] so the way to the bridge was open. But on the other side of the bridge there was a road paralleling the canal and there was a pill-box and a road block or tank trap. The pill-box was manned by fanatics. A lucky shot by a Piat man put a bullet through the slit of the pill-box killing everybody excepted an officer badly wounded and he got out signalling with his shirt that he want to be taken prisoner. He came across the bridge and in the center, german guns fired at him and wounding him fatally. He died in my quarters during the night.¹⁰

At the same time the regiments of 6 Brigade entered the suburbs along the second southern approach leading

towards the inner city. Saturday was spent clearing the railway station area and positioning for control of one of the bridges across the ring canal. It was not until 6 o'clock before the Canadians entered the inner city and heavy fighting broke out to secure a position across one of the bridges spanning the ring canal.

At about the same time, men of the 5th Brigade had successfully and without a great deal of opposition entered the northern suburbs of the city so that a pincher movement from the south and north drove the enemy into the center of the city. The only serious opposition came from a large hilly city park that enclosed the north west of the inner city. It was heavily defended by approximately 300 fanatical SS troops. A combination of infantry assaults assisted by flamethrowers and armoured support was necessary to dislodge the enemy.

The consolidation phase of the battle in the inner city resulted in the destruction of buildings in concentrated clusters by the enemy. That destruction was often deliberate in order to block some of the narrow streets. Resistance was overcome in part by the infantry, penetrating behind enemy lines through gardens and walls. This was often done through the help of local citizens hiding in their houses. Where it was possible, armoured vehicles supported the infantry and engaged German defenders in the buildings.

The centre of the city was marked by two adjoining large city squares far too wide for the infantry to cross safely. The Germans had set up a number of heavy machine guns in the ancient buildings lining the northern edge of the wide expanse. With the tanks of the Fort Garry Horse lining up at the southern edge of the two squares, their 17-pounder guns blasted away at the German positions causing heavy damage. Coupled with the fact that the Germans set fire to the buildings they vacated, the destruction of this section of the city was the most severe in the four-day battle. It was not until Monday morning before the Germans were driven into a tiny northeast corner of the city and any organized resistance came to an end by the surrender of the German commander, a colonel, to LCol J.J. Dextraze, commanding officer of Les Fusiliers Montréal.

Despite the destruction in the inner city, the basic infrastructure of the city escaped relatively unscathed. The railway station and its yards were not destroyed. The large hospital at the eastern edge of the city remained intact. The large natural gas plant continued to serve its customers. Electrical power, except for a brief period on Saturday, was not interrupted. In fact, it may be concluded that the battle for Groningen was fought in a series of controlled stages with units rotating between front-line actions. The way in which the battle was fought, reflected appropriate concern for the lives of Dutch civilians while attempting to ensure that

the Canadian soldiers had adequate support in an urban battlefield.

On April 12, the Canadian Provost Corps authorities reported that a total of 95 officers and 5,117 other rank of the enemy had been captured.¹¹ Extensive research in 1951 revealed that 130 Germans had been killed in the four-day action in Groningen. The remainder of the enemy forces (approximately 2,000) fled to Delfzijl where presumably they participated in the fighting around that city in the last two weeks of the war.

There are a number of plaques throughout the city that still remind the citizens of Groningen of that four-day battle. But this was not deemed to be enough. In 1995, 50 years after the war, the city of Groningen set aside six hectares of land to establish a liberation park of Maple Leaf trees. On each Remembrance Day, more trees are planted and although the forest is still in its infancy, this park will be a lasting memory of the 43 soldiers of the 2nd Canadian Infantry Division. They were among the last of the 5,852 Canadian sons who gave their lives for the liberation of Netherland from the Nazi regime.



ABOUT THE AUTHOR...

Mr. Ralph Dykstra is a retired secondary school teacher. Since retiring in 1996, he has completed a Masters of Arts Degree at Wilfred Laurier University under the tutelage of Professor Terry Copp, who is noted for his study of Canadian Army operations during the Second World War. This article is a condensed version of Mr. Dykstra's thesis.

ENDNOTES

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3. Ibid; p. 15.
4. Terry Copp, *The Brigade*, Stoney Creek: Fortress Publication, 1992, p. 192
5. M.H. Huizinga, *Maple Leaf Up*, Groningen: Uitgeverij J. Niemeijer, 1980, p. 71.
6. Drs. Chr. Van Welsenens, "De Duitse Vredediging van de stad Groningen aan het einde van de Tweede Wereldoorlog" in Groningse Volksalmenac, eds. W.J. Forsma, A.T. Schuitema, et al., Groningen: Erven B. van der Kamp, 1977, p. 105.
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10. Memo to Mr. Udd from Captain Jean R. Beauchemin. The letter was found to be among the collections of Mr. Huizinga at *De Stichting Oorlogs- & Verzetsmateriaal, Groningen*. The memo is undated and was translated from the French (all spelling, capitalization, and grammar irregularities of the original translation have been retained-Eds).
11. Huizinga, *Vier dagen*, p. 247.

The Future of Parachute Operations

by Captain David M.G. Beatty, CD

The planning of operations involving soldiers with parachutes on their backs, jumping from perfectly serviceable aircraft, carrying all they need to get on with the task at hand simply cannot be a serious proposition in an age where electronics and digitization are leading the cutting edge of the Revolution of Military Affairs. Parachute operations are just too old-fashioned. Aren't they?

Recent operations might suggest that this is not the case. After the United States inserted over 100 Rangers by parachute into southern Afghanistan to attack an airfield close to Kandahar as well as a Taliban complex, should it not have been asked why the nation most obsessed with technology used such an "antiquated" delivery method? Shouldn't they have deployed using helicopters, which most will argue are the best method for bringing lightly armed troops into action?

On examination of the Kandahar operation, a number of factors appear to show why it is now chic once again to jump rather than land. First is the matter of aircraft range. A CC-130 Hercules can deliver 50-70 soldiers over ranges of 2500 miles without in-flight refuelling. With in-flight refuelling, the range becomes virtually limitless. Compare this with the normal range of tactical transport helicopters. Even the best, the MH-53J Pave Low III, can only manage around 630 nautical miles without refuelling, at a speed less than half that of a CC-130 and carrying half the number of troops (37). The American UH 60 Black Hawk has even

... it is now chic once again to jump rather than land.

less lift capacity and a range of only 304 nautical miles. Canada's tactical transport helicopter capability resides in the CH-146 Griffon, which on a good

day is capable of transporting a maximum of eight soldiers a total of 656 km. Add armour and door guns, and this figure drops to four.

In contrast, airdrop is faster, delivers more combat power and reduces aircraft exposure time to seconds. It is also safer for the aircraft than landing on a foreign assault zone. With a para drop, the aircraft can drop the load and fly back to get another one. The science of airdrop has improved to where injuries are now at 0.5%¹ of the force delivered despite the bragging of some and the misconceptions of others, which are largely aimed at egotistically perpetuating the danger mystique associated with jumping. Parachute forced entry is about strategic combat power, not ego. The main advantage of parachute drops is the speed and concentration of troop delivery. Despite troops becoming separated by the very action of the drop, a high concentration can be achieved on the ground when dealing with the airborne delivery of a few hundred well-trained and well-equipped soldiers. In battalion-sized operations, the advantages of airdrops become even more predominant.

The future of aerial delivery is even more promising. Through the use of GPS navigation systems integrated with the CC-130 Flight Management System, the ability to drop troops and equipment to within 100 m of a target is a reality. The US has just completed a

series of demonstration drops in which they delivered loads of up to 2000 lbs from

an altitude of 10,000 feet within 400 metres of the initial point (IP). With the use of guided airdrop techniques, this envelope has been reduced to 50

metres. Canada's own Airborne Trials and Evaluations Section (ATES) has consistently put loads of 400 lbs within 50 metres of an IP from 10,000 feet. During the summer of 2002, the Canadian Army and Air Force conducted joint trials to overcome the limitations imposed by weather conditions. Through the use of blind airdrop techniques, it is anticipated that they will be able to drop troops and equipment in a "zero/ zero" environment. Further developments in stand-

The future of aerial delivery is even more promising.

off parachuting capability will allow for the delivery of troops and equipment from well outside a hostile air defence environment. All of this capability is readily available right off the shelf.

High speed air dropping of troops is not new. Although its roots were founded in the Second World War, France pioneered speed air dropping during the latter days of its war in Indo China, in which it conducted two major airborne operations and continued to develop its para-drop capabilities during the Algerian War of Independence with great success. The United States continued their developments in high-speed air drops and utilized them with great success in Grenada (1983) and Panama (1989). The British, having learned their lessons from the Suez drop, also continued to develop their high-speed para-drop capabilities and still consider air drops as a viable option. On a smaller scale, in the 1970s, the Rhodesians frequently utilized para delivery of troops, as their stock of helicopters was so small and they lacked the range to support operations.

Confirmed sightings of large terrorist groups meant that up to six RLI sticks would be deployed by a Dakota aircraft by static line

parachute—from as low as 300 feet—allowing scant seconds for 'chutes to open. Amazingly, the injury rate for these extremely low-level drops remained at under one per cent for the duration of the war.²

To return to the doctrinal point in hand: Why not resurrect para operations as a standard means of fulfilling a variety of missions? Hasn't the recent success of the US Rangers in Afghanistan illustrated to the world that parachute operations remain a valid option? Rather than the standoffish stance of the Canadian Army towards jump operations, shouldn't they be seen as an option available to commanders? Several of our allies continue to plan for para-type operations. In 1997, the UK planned on dropping 5 (Airborne) Brigade alongside France's 11^e DIP in central Africa during Op "Turquoise."³ At the same time, the US planned on deploying a battalion of Army Rangers to parachute in and seize the Kigali airport at night.⁴ While neither plan was executed, the fact that they were planned clearly illustrates the value being placed on para-type operations by our allies. More recently, the United States reactivated one of its paratrooper units, the Second Battalion (Airborne) 503d Infantry, in a ceremony 25 January 2002. This unit is now assigned to the Southern European Task Force.

If there is to be a debate, it should focus on the scale and nature of para operations rather than their validity. The Afghanistan example saw two companies delivered in a hostile air defence environment with great success. If a para drop was undertaken there, why is it seen as so dangerous in other environments? Does it not provide shock and surprise for the commander? Does it not allow for the rapid deployment of significant forces into almost any type of terrain?

If two companies can be successfully dropped into a target area and



A mass drop during the Second World War. Are the strategic advantages of parachutes operations simply too important to be left to the Army? (Courtesy National Archives of Canada)

carry out their mission, then why not a reinforced battalion of four to five companies (including a support company) plus integral fire support resources and communications? All can be delivered by 26 CC-130s complete with three to four days' worth of logistical supplies. For a battalion-level raid, substantially fewer aircraft would be needed. Here is a capability well within our grasp yet not being considered as an option.

History has shown that para-based units can be kept on a higher state of operational readiness (the norm for our allies is 48 hours) and less expensively than mechanized forces. In addition, the battle procedure cycle is greatly reduced. The ability to rapidly deploy a significant force anywhere in

the world provides a significant strategic tool that can be brought to the table. Furthermore, it buys time for the deployment of medium weight forces, which, in an ideal world, comprise the "follow-on" force.

As we embark upon the 21st century, the Army has hung its hat on the LAV III Coyote, which arguably is one of the best IFVs (infantry fighting vehicles) on the market and the envy of our allies. The drawback is the strategic lift to get it there. With the "come as you are" approach to warfare in this century and the Canadian Forces' lack of national strategic lift, shouldn't we consider para operations as an option?



ENDNOTES

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2. Dick Gledhill, *One Commando – Rhodesia's last Years and the Guerilla War it Never Lost* (self-published), p. 56.

3. Daniel Byman et al, *Strengthening the Partnership*, "Improving Military Coordination with Relief Agencies and Allies in Humanitarian Operations," Rand Corporation, p. 200.
4. Alan J. Kuperman, "Rwanda in Retrospect," *Foreign Affairs* 79, 1 (Jan-Feb 2000), pp. 94-118.

The Dirigible – A Phoenix Rising from the Ashes

by Lieutenant-Colonel Christopher Thurrot, CD, and Major Shane Jennings, CD

Military forces would greatly benefit from the employment of a modern airship. Military forces need flexible transportation into undeveloped nations as demonstrated in Rwanda, Cambodia, and lately in Afghanistan. Any force that harnesses the extensive capabilities unique to the lighter-than-air (LTA) ship would be greatly enabled. The dirigible is a viable heavy lift vehicle for military forces employed in combat, on peace support operations, and in humanitarian relief missions.

INTRODUCTION

In 1999, NATO re-emphasized a move from a large, static force structure to one of fewer, more mobile forces that could react to a wider range of contingencies.¹ Canada has a very limited strategic lift capability to meet this new vision but has embarked upon a modest procurement program of traditional vehicles.² The use of heavy lift would be an integral part of the deployment phase of an operation as deploying forces are transported into an operational theatre and then forward into the combat zone.

At no time did this become more evident than with the onset of operations in Afghanistan. Canada's ability to deploy forward and begin operations was bottlenecked by the Coalition's ability to move personnel and equipment forward into the area of operations. In order to address this issue for future operations, the Canadian Forces should examine the utility of the dirigible as a transport asset. While dirigibles would not replace existing strategic lift, they do have the capability of augmenting traditional carriers in establishing and sustaining operational theatres. A

familiarity with the dirigible's history would aid in understanding its current stature in the aerospace world.

HISTORY

The history of LTA flight began with the first hot air balloon built in France in 1783 by Joseph and Etienne Montgolfier. During the American Civil War, balloons quickly proved to be an invaluable military asset. A military scout could be positioned several hundred feet in the air and survey the battlefield or reconnoitre an enemy's position. However, balloons remained largely unsteerable. By the turn of the 20th century, once steering problems were solved and a lightweight gasoline engine was developed, the airship proved itself to be flexible, efficient and relatively inexpensive to operate.

During the 1930s the use of airships peaked and then, in large part as a result of highly publicized accidents, their use was dramatically curtailed. The onset of World War II brought about a renewed interest in airships and hot air balloons by the US military. The US Navy successfully

The rapid development of jet engine technology during and after the Second World War all but halted further development of the dirigible,³ and in 1958 the U.S. Navy stopped blimp operations. Until the late 1980s, airships were abandoned as a means of transportation, being relegated to the role of flying billboards. Technological advances sponsored by the commercial sector have resurrected the dirigible as a viable cargo carrier, but its military utility as a heavy lift vehicle remains untapped.

THE DIRIGIBLE

There are four categories of airships: rigid, semi-rigid, non-rigid and hot air airships. Rigid airships are defined by an internal frame. The rigid structure, traditionally an aluminium alloy, supports the form of the airship. Famous examples include the Zeppelins and the USS Akron and Macon.

Semi-rigid airships are usually comprised of a rigid lower keel construction and a pressurized envelope above that. The rigid keel could be attached directly to the envelope or hung directly underneath it. One of the

... the Canadian Forces should examine the utility of the dirigible as a transport asset.

employed 160 non-rigid airships, nicknamed "blimps," as anti-submarine craft. Their ability to remain aloft for up to 11 days and escort surface ships without having to refuel or constantly circle back and forth across the protected convoy made them ideally suited for the purpose. During the war, submarines sank no surface ship under blimp protection, and only one airship was lost to enemy action.

most famous balloons of this type was *Italia*, the airship that was used in an attempt to reach the North Pole.

Non-rigid airships or blimps are the most common form at the present time. They are basically large gas balloons and their shape is maintained by their internal overpressure. The only solid parts of blimps are the passenger car and the tail fins. All the airships

Ultra-Large Airlifts (ULA) — The Concept

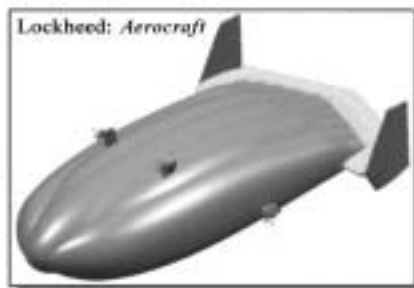


Target: Commercial Middle Market

Air – 10x cargo of conventional aircraft
Sea – 5x the speed of surface ships

**Hybrid Inter-Theater
Airlift Vehicles**

LIFT:
65% helium
34% aerodynamic



DoD Concept: Envision a "CRAFT-Like" Role

currently being used for advertising and publicity are of this type. The last segment of dirigibles is the hot air airships. Also known as thermal airships, these balloons are counted as a fourth type even though they are technically part of the non-rigid category.

ADVANCES WITHIN THE INDUSTRY

A German effort, the CL-160 (Cargo-Lifter),⁴ is the most advanced model of dirigible currently being developed. Its "proof of concept" scale-down prototype, the CargoLifter Experimental Airship, made its inaugural flight on 18 October 1999. The company has begun construction on the full size prototype and has also received interest and orders from the commercial sector. Full-scale production in Berlin, Germany as well as at its new production facility at New Bern, North Carolina will begin as early as 2004, at a rate of four to five dirigibles a year.

The CargoLifter CL-160 design is an integration of new "flying crane" technology and a patented loading and unloading process into a dirigible. The 260 metre long, 65 metre diameter, semi-rigid dirigible will be buoyed by helium, a non-flammable element. It will be capable of transporting 160 tonne loads—equivalent to 36 standard 40-foot containers or a 30-tonne increase over the capacity of the C-5.⁵ In addition to a range of 10,000 kilometres, the CL-160

will cruise at a speed of 80 to 120 kilometres per hour. This capability would not allow for delivery at the same speed as heavy lift cargo planes such as the Antonov An-124, but the dirigible would not require the same handling facilities. Moored above the delivery site and without touching the ground, the dirigible would lower the loads using an integral crane. A working crew of five, including a navigator and two cargo masters, would fly the ship. The loading cycle would be three-quarters of a day to load and half a day to unload. Multi-box containers can be designed to carry standard sea containers or self-contained facilities such as a fully equipped hospital or headquarters. The more advanced design would have the multi-box container unloaded in less than an hour. The first CargoLifter is estimated to cost 122 million Eurodollars (US \$73.5 million), including the cost of development through to the flight test of the prototype.⁶ Compare this to the cost per unit of the C-5 (US \$149 million)⁷ or the C-17 (US \$240 million).⁸

Another leading edge prototype is the SkyCat 1000,⁹ which is designed to be 1,003 feet long with an overall capacity equivalent to ten 747 payloads. It will be able to carry twelve tanks (compare that to the C-5's capacity of just one tank!). It will have a range of 6,000 miles and thus be able to cross the Atlantic Ocean and return without refuelling. With a top speed of 110

knots, the SkyCat 1000 is significantly faster than a ship. This design seems destined for use in the battle space of 2015 as envisioned in current US doctrine.

BENEFITS

There are a number of benefits that clearly set the dirigible apart from its competitors as a very efficient heavy lift asset. These benefits include a relatively modest fuel consumption rate, low noise and exhaust fume levels, routes that are clear of traditional airways and port facilities as well as a point-to-point delivery capability. The dirigible's payload capacity is superior to the truck and most airplanes. The dirigible has superior endurance that offers a seamless, worldwide transport capability as well as point-to-point delivery at speeds five times faster than ships. The cargo-loading process utilized by the dirigible offers far superior capabilities to other forms of heavy lift assets. Since the dirigible will load and unload anywhere, delivery could be made to areas with little or no infrastructure. Expensive and time-consuming cross loading requirements are eliminated, and the total area needed for loading and unloading land operations would be only 100 square meters. Currently, the C-17 requires a runway of 1,000 meters and the C-5 requires one of 1,500 meters.¹⁰ The point-to-point transport times could be cut by a factor of 10 compared with traditional multi-modal transport (rail, sea, and truck combinations),¹¹ and the complexity of transportation plans, and their risks, would be reduced significantly. The threat of mines in ports and airfields would essentially be nullified, and, should there be a delay imposed by the recipient, the dirigible would be flexible in its off-load timing, staying aloft off-site for long periods of time if necessary.

Dirigible detection becomes an operational issue that is being addressed by designers. The dirigible will have a low noise level due to engine design, and the propulsion system will be provided by diesel engines with a low infrared signal. The hull's radar signature will be negligible due to the characteristics of the hull materials.

Dirigible maintenance costs are estimated to be comparable to those of other aircraft. The combined purchasing, operating and maintenance costs are estimated to be one third those of fixed-wing aircraft. Dirigible production costs alone are forecasted to be almost half those of equivalent cargo airplanes.

The production cycle time for a dirigible is also impressive. The cargo-carrying dirigible will be a combat logistics direct-delivery system that can be produced in three months versus a one-year production period for aircraft and three years for ships. The dirigible will also have the potential to carry a variety of weapons systems and armament, including internally mounted phased-array radar and air-to-surface missiles.¹²

EMPLOYMENT

The dirigible has the potential to be employed during all phases of an operation: mounting, initial deployment, force build-up, sustainment and redeployment. Deployment and redeployment phases of an operation would see the dirigible excel in its ability to deliver materiel direct from the point of origin to an in-theatre location. In the past, Canada's strategic transport into or out of an area of operations has been effected using Canadian Forces airlift in combination with commercial carriers.

Deploying forces may have to wait for the contracting process and commercial lift availability in multi-modal transport systems when there is insufficient military lift.

The challenges of force build-up include marshalling, embarkation, debarkation, transit time, transport availability, vulnerability and cost. A good example is the build-up by the Coalition forces in advance of the land operations of the Gulf War. Under the direct-delivery concept, a force could eliminate cross loading and bulk breaking once in theatre and tailor the shipment to the specific needs of combat forces at its destination.

The current Canadian Forces strategic policy regarding sustainment requires ninety days of stock for an operational theatre. Its composition would include thirty days of supply at the operational and tactical level, thirty days en route, and thirty days being procured and prepared for shipment. In a major crisis, the Canadian Forces would benefit from the use of dirigibles as a complement to its limited heavy lift resources and commercial contracts.

The use of dirigibles would permit point-to-point delivery of containers throughout Canada and along strategic and operational lines of communi-

cations. The dirigible would transport cargo from national sources such as supply depots, garrisons, 3 Canadian Support Group (Montréal) or manufacturers directly into the theatre. Direct delivery could occur in the communications zone to the forward logistics base and the Canadian Support Group or anywhere along the lines of communication forward to the combat zone. The use of the dirigible has the potential to redefine the roles of support units.

Adapting current sustainment doctrine to the use of dirigibles would not mean a major reconfiguration of the battlefield layout. The communications zone, which marks the end of the strategic level of administration and the beginning of the operational level, would remain. The Canadian Support Group would continue to provide operational-level sustainment in the move of materiel and services forward of the theatre logistics base. Its responsibility for transportation, supply, maintenance and finance, as well as personnel support services and health services support, would remain. The dirigible would enhance the force's capability for operational sustainment. The general support assets of the Canadian Support Group and the forward mobile support battalions would continue to provide the bridge between operational-level and tactical replenishment. Theatre units would continue to deploy, but replenishment could come from Canada direct to them by dirigibles that would over-fly the traditional points of entry.

The use of dirigibles would respect the fundamentals of sustainment.¹³ The cross loading and transshipping through the communications zone could be significantly reduced, and the dirigible's use from Canada direct to the tactical level, given air supremacy, could relieve the strain on the Corps Support Command (COSCOM) resources in providing combat supplies. The dirigible would provide a single, seamless forward supporting system and a pipeline for Canadian unique items.

While the use of the dirigible would be primarily directed at the replenishment system, it could also support the Land Equipment Management



Time/Distance Comparison					
Location		Mode of Transport			
Load	Unload	Ship	Hercules	Airship	Rail
3 CSG (Montréal)	Haiti	14 Days	6 Hours	30 Hours	
3 CSG (Montréal)	Bosnia	22 Days	8-24 Hours	66 Hours	
3 CSG (Montréal)	Kosovo Area of Ops	26-35 Days	48 Hours	72 Hours	
Edmonton	Montréal		7 Hours	30 Hours	2 Days

Figure 1: Time/Distance Comparison. An example of transit times to Haiti, Bosnia, Kosovo and within Canada presents an interesting picture of lift capability.

System through the transport of vehicles and equipment casualties back along the lines of communication. It could also be used in support of the Health Services Support System by delivering pre-containerized field hospitals from Canada into a theatre or personnel casualties out of theatre. The dirigible could be used strategically as a heavy lift vehicle, operationally within theatre as a workhorse in the communications zone and in forward delivery direct from Canada or from the communications zone into the combat zone.

TIME/SPACE COMPARISON

As an example of a deployment scenario, the recent Canadian Forces deployment for Operation "Kinetic" in Kosovo was formed around a Canadian infantry battle group and included a reconnaissance squadron (Coyote) and a tank troop (Leopard C2). There were 246 vehicles, weighing 2,100,269 kilograms in total, and 159 sea containers, weighing 1,295,850 kilograms, which were delivered using a multi-modal transportation program.¹⁴

As an example of a sustainment use, NATO embraced the use of sea containers during the 1980s in response to the heavy logistics requirements generated by the deployment of modern forces. For example, a typical United States mechanized infantry division requires 566 tonnes of supplies per day while in reserve or 2,513 tonnes per day during attack operations. To move this load in the attack, the division requires 251 standard

cargo trucks (heavy logistics vehicle wheeled) or 16 dirigibles (CargoLifter CL-160s).¹⁵

The daily replenishment requirement for each soldier in the theoretical 11 Canadian Infantry Brigade (CIB) is 106 kilograms, a brigade total of 496 tonnes.¹⁶ Using weight as the only parameter, this represents the equivalent loads of 25 Hercules, 50 standard cargo trucks or three CargoLifters.¹⁷

It is important to note that the contracting of ships and rail requires on average 5-8 days advance notice. Materiel travelling by either ship or Hercules would need to be loaded and then transported to destination. This would require specific materiel handling equipment (MHE), double handling of materiel, and additional travelling days for storage (awaiting vehicle availability) and movement to the unit site. Materiel moving by Airship will be taken directly to the location required and on-board MHE would place the materiel on the ground in that location.

VULNERABILITY

The issue of the vulnerability of dirigibles both in day-to-day operations and in a battlefield scenario must be addressed. The visual spectacle of the *Hindenburg* burning to the ground in front of horrified spectators is an image that continues to haunt the airship community. Great technological advances have been made in

materials, engines and the use of gasses since then. Modern dirigibles make use of helium that is totally inert, non-flammable and an excellent fire extinguisher. The exterior of a modern LTA vessel can absorb many bullet holes and still operate quite effectively. Unlike a toy balloon, the lifting gas in an airship is at a very low pressure, just sufficient to keep its shape. As a result, gas escapes through a hole very slowly and the buoyancy is not substantially affected. A larger hole would mean that the airship mission would have to be aborted, but the airship could still return to base for the necessary repair. In addition, much like an AVGP (armoured vehicle, general purpose) tire, the envelope is composed of a series of balloonets. Piercing a number of them does cause loss of pressure of the affected balloonets but only a much more gradual loss of pressure in the dirigible as a whole. There would not be the same catastrophic results, a crash, as when fixed- or rotary-wing aircraft are disabled in the air.

Advances have been made in all areas of airship technology – propulsion, stability, control, buoyancy, strength and weight. By incorporating new design materials, including high-

The dirigible could be used strategically as a heavy lift vehicle

density, multi-layer membranes such as Mylar film, Dacron/polyurethane and polyethylene film, designers are able to limit helium loss to virtually zero. Hull materials are now non-flammable, lighter and more durable. The use of titanium, Kevlar, graphite, fibreglass, aluminium alloys, modern steels and carbon-fibres permit new hull contours and revised tail plane designs. These innovative designs allow the employment of more powerful main and manoeuvre engines, thus simultaneously increasing both speed and manoeuvrability in an all-weather environment.¹⁸

A modern airship's advanced construction and sophisticated control system make it extremely safe to operate,

even in bad weather. Historically, non-rigid airships have the best safety record of any type of flying vehicle. Testing has shown that they are able to operate in temperatures ranging from -160 degrees to +250 degrees, wind speeds in excess of 223 kilometres per hour or with snow loads of over 50 kilograms per square inch. They also have the ability to withstand a wide range of electronic effects that would be placed on the structure during electrical storms and over the battlefield.¹⁹

POTENTIAL MILITARY USES

The list of potential military uses for the dirigible is far ranging, encompassing tasks as varied as heavy-lift to patrolling and surveillance. An LTA ship has a very long operational range and can stay on station for days if circumstances require. Currently, Lockheed Martin supplies aerostats and associated ground equipment to the US Air Force Air Combat Command for use along the southern US border. Eleven aerostats watch over the air, land and sea lanes from the southern tip of Florida to the Arizona border. These aerostats are tethered to the ground and fly at an altitude of up to 15,000 feet, providing overlapping coverage of more than 200 nautical miles.

Another military function ideally suited to airships is airborne early warning. The LTA ship can carry a very large aperture antenna, measuring 40 feet in diameter, and can hover or patrol slowly for long periods while creating very little noise.

Mine Counter Measures is another task at which airships can excel. Modern minesweeping is accomplished

A nation of Canada's size requires an integral, national strategic lift capability...

using advanced sonars and remotely piloted vehicles (RPVs), both of which can be accommodated and deployed from an airship. The airship can self-

deploy over intercontinental distances and arrive in theatre in advance of the arrival of the main force, when the need for minesweeping is greatest. In addition, airships are immune to the effects of an exploding mine.

The signals and communications function can also benefit from an airship performing in a telecommunications role. A stratospheric airship is designed as a geo-stationary telecommunications platform, which can remain on station for up to five years and is recoverable when its equipment needs replacing.

PEACEKEEPING

The primary advantage of dirigibles under peacekeeping conditions is that they can self-deploy over trans-oceanic ranges and, once in theatre, can conduct vital reconnaissance. Food can be distributed in small packets appropriate to small communities, thus reducing the need for already malnourished people having to walk many miles to distribution centres. Access problems caused by land mines or warring factions are solved because the dirigibles can go above or around these areas. Dirigibles are also big enough to conduct mass evacuations. Dirigibles cost less than helicopters to operate and are cheap in comparison to any other conventional alternative.

HEAVY MILITARY LIFT

Following the experiences in the Gulf War (1991) and the Balkans (1999), strategic airlift features as a top priority force structure improvement for the US, UK, Canada and NATO as a whole. During the Gulf War, US forces were split between airliners, air freight and sea freight to get to the theatre; the task of re-constituting into fighting formations was described to Congress as a nightmare. In the Balkans, the critical shortage of strategic lift was exacerbated by the poor airfield infrastructure in the forward area and low fuel stocks. Low

fuel stocks at the theatre airports meant that the C-17 strategic airlifter, capable of carrying loads in excess of 70 tonnes, averaged only just over 40 tonnes into theatre because it had to carry exit fuel.

Dirigibles would have been beneficial in such operations as Rwanda, whose land-locked nature posed many transportation problems, or in Cambodia (UNTAC), when the rainy season closed the main roadway, or in Bosnia (NATO Sustainment Force) when large, heavy and cumbersome cargo such as helicopters were required quickly and on short notice. The ability of the Canadian Forces to deploy the Disaster Assistance Response Team (DART) is dependent on a functioning airfield. The employability and operational effectiveness of the

... potential military uses for the dirigible is far ranging...

DART would be greatly increased if it could be deployed direct from garrison to the disaster site.

The speed of a dirigible is less than that of a C-17, but the load carried has the potential to be much larger. Speed follows the hare-and-the-tortoise model when a transport stream is considered: as is the case in any large deployment, once the pipeline is filled, the speed becomes largely irrelevant. Only the tonnage delivered per day is important, and a dirigible can do as well as any of the on-line strategic airlifters at a much lower cost in terms of acquisition, direct operating costs and aircrew.

A NATION'S STRATEGIC LIFT CAPABILITY

A nation of Canada's size requires an integral, national strategic lift capability to assure the mobility of its armed forces for domestic security and humanitarian relief at home and abroad, and to honour its commitments to its alliance partners. The 1996 United States Defense Science Board and the 1998 Army After Next Report to the Chief of Staff of the Army

strongly suggest that the Department of Defense explore the capabilities of this type of airship. Currently,²⁰ several United States agencies—the Joint Staff, the Logistics Management Institute, the Army and NASA²¹—are examining the long-range capabilities of airships. The United Kingdom Ministry of Defence was engaged in an Airship Feasibility Study examining possible military roles. The 1997 results of the study demonstrate that the airship could be used as a military platform.²² Since that study was accomplished, the U.S. has been pursuing the use of dirigibles as a major component of its heavy lift strategy into the year 2015. With a number of nations investigating the utility of the airship, Canada could enter a joint venture, potentially within NATO, to further develop and produce a dirigible for military heavy cargo lift.

CONCLUSION

Airships are a safe, flexible and efficient heavy lift proposition. Because their lifting power is generated freely from the gasses they contain, they need to consume fuel only to move forward through the air. The dirigible's point-to-point delivery capability, favourable economics, quick production times and small crew give it

unique advantages. The airship's ability to move large weights, remain on station for extended lengths of time, keep operating costs low and operate quietly in hostile environments all contribute positively to its future. The LTA has a very low radar signature, roughly equivalent to a light twin-engine airplane. Airships are highly

The dirigible would offer the Canadian Forces flexibility...

fuel-efficient, have relatively low initial costs (compared to traditional aircraft), and cost less to maintain and support on a day-to-day basis. They do not rival airplanes and helicopters but fulfil entirely different roles, filling in the gaps left by these more conventional aircraft.

Restructuring and ever-decreasing fixed wing resources cause our aircraft fleets to be overextended with the potential of exhaustion in times of crisis. Availability of commercial transport resources is not always guaranteed. Dirigibles would enable deployment before commercial resources could be made ready. The dirigible would offer the Canadian Forces flexibility due to

its capability to provide transport of heavy cargo in Canada, strategic transport across oceans and operationally within theatres.

The Canadian Forces' experience in commercial contracting and transit times, combined with the limitations of CF assets, clearly indicate that the dirigible would add a capability and flexibility that would aid in deployment and sustainment. Complementing traditional heavy lift assets, the dirigible could be the vehicle that links the nation's resources directly to the end of the lines of communication and the fighting force. Its employment range would include all phases of an operation, including the deployment, build-up, and redeployment phases of an operation as well as ongoing sustainment. The dirigible's advantages as an inter- and intra-theatre transportation vehicle would greatly enhance Canada's ability to project its presence, including sustainable combat forces, domestically and internationally across the spectrum of conflict.



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Major Shane Jennings joined the Canadian Forces in January 1987 after obtaining a bachelors degree in business administration from Simon Fraser University in Vancouver. His service has included tours at CFB Lahr and as the Quartermaster of 4 Air Defence Regiment, during which time he was involved in the acceptance of the 35mm Twin Orlikon guns and Skyguard acquisition system and the introduction of the Air Defense Anti-Tank System (ADATS). In July 1993, Major Jennings was posted to Geilenkirchen, Germany as the Technical Services Officer of the newly formed Canadian Forces Support Unit (E) (CFSU[E]). He was then posted to the 1st Canadian Division Headquarters and Signal Regiment as the Regimental Quartermaster. He is a graduate of the Masters of Business Administration program offered at The Royal Military College of Canada. Following graduation, Major Jennings was posted to his current assignment as the Director General Operational Research (DGOR) representative in the J4 Directorate.

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2. Ibid., p. 14.
3. Lt Col Donald E. Ryan, Jr., USAF, *The Airship's Potential for Intertheatre and Intratheatre Airlift*, Air University Press, 1993, p. 24.
4. Michael a Taverna, "Heavy Lift Dirigible Demo Nears First Flight," *Aviation Week & Space Technology*, 151, 3, 19 July 1999, p. 41.
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- sustainment are foresight, economy, flexibility, simplicity, cooperation and self-sufficiency. The use of the dirigible and containers would enhance the CSS commander's flexibility of response, economical use of transport resources and simplicity of planning through reduction in cross loading.
14. 3 Canadian Support Group Operations Officer Electronic Mail, Wednesday 17 November 1999.
 15. Ryan, p. 6.
 16. 11 CIB: 4681 personnel, 623 mechanized vehicles, and 723 soft-skinned vehicles. Maintenance load of combat supplies for 11 CIB is 16.23 pallets of rations, 309 pallets of ammunition, 67,276 liters of water, 101,448 liters of bulk fuels, and 14,690 liters of packaged POL (petroleum, oils and lubricants). Estimated at 67.86 kilograms of combat supplies per man plus 38.1 liters of fluids including water, blood, and fuels.
 17. Although there are four manoeuvre units in 11 CIB, it would be rare to form more than two battle groups. This would leave two battalions (-).
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Fighting Machines for Manoeuvrist Warfare and Beyond

By Sergeant Arthur Majoor, CD

INTRODUCTION

Manoeuvrist doctrine is the fashion among Western armies today. Although there are many interpretations, the doctrine is generally understood to mean dislocate the enemy physically and mentally by rapid movement in the area of operation, rapid massing of force and fire at the point of contact, and using speed and shock to foreclose his options. These principles were understood even in the ancient world. Roman legions could march quickly to confront enemy armies, and maniples (legion sub units), arrayed in a checkerboard fashion on the battle, could rapidly change orientation to face enemies, mass “fire” by hurling *pila*, then close in with sword and shield to finish the job.

Doctrines like the US Army’s *AirLand Battle*, coupled with powerful machines like the M1 Abrams tank, exemplify this style of war. Manoeuvrist doctrine requires the ability to conduct manoeuvre both at the operational level (displacing the enemy through rapid

German tanks routinely outgunned Canadian Armoured units, shooting attacking units to pieces before they could come to grips with the defenders. By preventing or suppressing tactical manoeuvre, the Germans also slowed and disrupted Canadian operational manoeuvre.¹ By and large, Canadian units were forced to hammer their way through the enemy rather than being able to dislocate the enemy through movement. The Canadian Army is adopting manoeuvrist doctrine for the 21st century but lacks the equipment to fully implement it. The LAV series of vehicles allows for manoeuvre to the point of contact but have difficulty thereafter.²

In the Army of the Future, advanced communications and organizational techniques could change the doctrine to one of swarming the enemy with force or fire. Most interpretations of the revolution in military affairs (RMA) focus on delivering precision fire against the enemy through high technology munitions but rarely speak of swarming him with our soldiers in close contact.³ Swarming with force



The leap to mobility: decisive victory overcomes attrition. Colonel General Hans von Seeckt was Chief of the German General Staff, 1919-1920, and Commander in Chief of the German Army, 1920-1926. Through comprehensive analysis, promotion of widespread debate and dynamic leadership, Von Seeckt broke the intellectual stagnation of the Reichswehr, and ultimately transformed warfare. Are our methods about to change again? (Courtesy James S. Corum)

Most interpretations of the revolution in military affairs (RMA) ... rarely speak of swarming [an enemy] with our soldiers in close contact.

organization and movement) and at the tactical level (massing force and fire at the right place and time, and being able to control the battle on your terms under contact). Without both elements, manoeuvre doctrine is incomplete.

Canadian troops in the Second World War discovered that doctrine is not sufficient on its own. Superior

may be required for military operations in difficult or urban terrain or as a means of dealing with low-level conflicts in operations other than war. Another aspect of RMA that is not often commented upon is that swarming or other forms of self-organized behavior are often predicated on interaction of similar actors, just like birds of one species gather together to make a

flock.⁴ This suggests future military units may be composed of similar sub- and sub-sub-units to reduce “friction” by eliminating heterogeneous units and enable self-organizing behavior to take place.

As a conceptual experiment, this paper will describe a hypothetical fighting machine that allows for protected manoeuvre while in contact and can evolve with the organization to engage in swarm tactics in the future.

For ease of understanding, this machine and all systems described already exist in their basic form and are relatively inexpensive in current military terms.

ACHZARIT AS A MANOEUVRIST VEHICLE

The Israeli Defense Force (IDF) recycled captured T-55 tanks into its own inventory after the 1967 and 1973 Arab-Israeli wars. Over time, more modern tanks have entered IDF service, allowing the T-55s to be retired. The IDF began a program in the 1980s to modify the now surplus tanks into APCs. The end result was the Achzarit. The modifications were extensive. The turret and top deck were removed, and the Russian engine and transmission were replaced with a compact power pack. A revised internal layout of equipment allows for a vehicle crew of three- and a seven-man mounted section to be carried within. A new roof and a clamshell rear door were added, along with a modified suspension and external armour.⁵ The basic vehicle is armed with a 7.62 mm M 240 (similar to a C-6) on a Rafael overhead weapons station and two more M 240s mounted on either side. Other weapons (such as .50 cal HMG's or 40 mm grenade launchers) can be mounted in place of the 7.62 mm machine guns, and the vehicle also mounts banks of smoke grenade dischargers and a 60 mm mortar. In concept, it is a heavily protected battle taxi, weighing 44 tons and designed to bring troops in and out of action with maximum protection. It has similar mobility to the Merkava main battle tank and presumably works in combined arms combat teams with the Merkava tanks.

For the conceptual experiment, picture the Achzarit modified to include an armoured launcher on the rear deck with three or four Javelin fire and forget missiles in battery. The current version of the Javelin has a range of 2000 m and is designed to deal with enemy armour as well as having limited anti-helicopter ability.

The launching post includes a day/night and thermal imaging sight, and the entire assembly is man portable by two infantry persons.⁶ Using fire and forget missiles mounted on the vehicle allows precision fire against enemy armour and emplacements, while the vehicle is also able to manoeuvre in close contact due to its impressive armour protection. Armoured regiments would have the same vehicle, except the crew compartment would be given over to a loader's station and reloads of Javelins, a division similar to the M-2/M-3 vehicles in the US Army.

The combat team equipped with the modified Achzarit would have many advantages. The infantry and armour would have the protection needed to conduct manoeuvre even when in close contact with the enemy. Infantry commanders would be able to "shoot from the hip" with their missiles when suddenly confronted by a hard target, while the armoured crews would use their training to deal with hard targets in a more deliberate manner. On-board support weapons give the dismounted

Swarming may be the best means of dealing with an enemy...

infantry excellent firepower to cover their advance. The heavy armour also allows crews to mount directional mines to the outside of the vehicles to clear the immediate area in the dismount zone.

As a manoeuvrist vehicle, it resolves the problem of tactical manoeuvre in close contact with the enemy. The hypothetical Achzarit is able to move to the point of contact, mass fire and force on the enemy at the decisive moment, and manoeuvre through the point of contact. While out of contact, the vehicle is capable of movement both cross-country and by road. As well, the machine has the power and traction of a tank, which allows mobility aids such as plows and mine rollers to be carried, increasing the ability of the team to manoeuvre both in and out of contact.

Although three times as heavy as a LAV III, the Achzarit is still 20 tons lighter than a third generation tank like a Leopard 1 A5 or the M1A2. Logistics and mobility considerations would be similar to the current Leopard C2.

One vehicle type can fulfill multiple roles, being a troop carrier for infantry, armoured assault troops and combat engineers or a direct fire platform for armour, anti-armour and the armoured recce. With various modifications, the entire manoeuvre element can be under protection. Versions could include an Achzarit forward observation officer/mortar fire controller, mortar carrier, surveillance vehicle (with a rapid deployment version of the Coyote's mast), engineering vehicle, and so on.

ACHZARIT AS A SWARM VEHICLE

In the Army of the Future, RMA enabled forces will have to deal with enemies who will use every means at their disposal to frustrate our operations. Camouflage, dispersal to difficult and urban terrain, and the use of civilians or hostages as human shields are methods we have already seen in the Persian Gulf War, Kosovo and Afghanistan. The American anti-terrorist campaign

is currently dealing with these problems: Taliban soldiers hide themselves in civilian houses, while tanks and other equipment is hidden in deep cave complexes or parked in Mosques, schools or hospitals. Conventional bombing raids work very slowly. Many targets are "out of bounds," and direct action is required by special forces and other ground troops to eliminate hidden hardware and forces.

Swarming may be the best means of dealing with an enemy who operates in this fashion. Our own forces are dispersed to cover the maximum ground both to detect the enemy as well as to limit his ability to damage our forces. Once an enemy is located, he is attacked from all angles by "swarms" of fire or force.

The hypothetical Achzarit of the manoeuvre function is still a viable player in the swarm function. Only a few reasonable assumptions have to be

area.⁸ "Flocking" or swarming behavior will manifest itself when certain conditions are met, as defined by a simple, common rule set that all

protection envelope, while providing a clear crew space. Even the launcher can be adapted from existing products like the TOW under armour turret or the American Hammer-head TOW turret. High power-to-weight ratios can be obtained through advanced diesel engine technologies (like that of the French LeClerc tank¹⁰), turbine power packs like the M-1 or, in the future, fuel cell electric systems.

Canadian troops may discover themselves in the same predicament in future operations that their predecessors did in the 1940s.

made to allow it to operate as part of a swarm. First, the main battery of missiles has to be improved both in terms of range and terminal effect. Evolutionary developments of the Javelin will be able to meet these needs. To swarm fire, the missiles will have to be able to accept target data from other sources or platforms as well as from their own dedicated sight. Once again, this seems to be a reasonable expectation of technical evolution. When operating alone in the dispersed mode, the Achzarit has both armour and close support weapons (three machine guns, a mortar and smoke grenade dischargers) to allow it to survive. The crew can fend off enemy attacks with on board weapons and the dismounted section until friendly fire and their team partners arrive.

When operating in the swarm, each member vehicle of the team will be configured in a similar fashion. The manoeuvre function distinction between armoured and infantry will be gone. Each vehicle will have a small dismount section and several sets of reloads for the missile battery. The armoured skill set will lie with the vehicle crew, while the infantry skill set will lie with the dismount section. Technical evolution, miniaturization of components, and operational experience will allow the interior of the vehicle to be rearranged to make best use of space, while changing demographics suggest the dismounted sections will be very small, perhaps only 4 or 5 soldiers per vehicle.⁷ This configuration will allow for a useful number of reload rounds to be carried, in addition to the dismount section.

Teams will be given areas of responsibility and act as "landholders" responsible for activities within that

members of the team know and understand. Since each team is composed of similar sub-sub units, the amount of friction both within and between teams will be minimized. Once again, the power and traction of the Achzarit allows mobility aids to be carried, reducing the number and types of specialist units required. If the evolved Javelin is indeed an "all purpose" weapon capable of providing effective anti-air, anti-armour and "bunker busting" fire, the teams in the swarm will be truly self-contained, eliminating the need for many layers of command and control required to operate heterogeneous units.

REALITY CHECK

The actual Achzarit is an exercise in resource management, recycling old tank hulls to fill a gap in capability. As an APC, it does have the protection, mobility and firepower to accompany Merkava units into battle, but the mobility is compromised by the great weight and the mounted section has no situational awareness. Similar exercises in resource management like the BTR-T⁹ are even worse, having an internal layout that only allows for a five-man section and giving the dismounted section only top hatches to enter and exit the vehicle.

If a vehicle were to be built on these principles, it would have to be designed and built from the ground up. This need not be an expensive exercise. The hull is fairly simple, and powerpacks, drive trains and suspensions can be readily purchased from existing product lines. The internal layout would maximize protection by arranging parts like fuel tanks and the engine block near the front, to add the mass to the armour

In the Canadian context, a single platform with the ability to engage in tactical manoeuvre and the adaptability to meet many roles would solve many existing problems. If designed around existing military and commercial off-the-shelf subsystems and built in large quantities, both the program cost and the unit cost would be quite reasonable, and it could be expected in service very quickly. It would even be possible to arm Reserve units with these systems first, on the reasonable assumption that existing LAV units can be more easily transported to operational theatres to establish a presence, while Reservists can prepare during the interval that heavy transport is arranged for follow-up forces.

CONCLUSION

Doctrine is a guide to how to accomplish our goals. Doctrine that is well thought out and practiced can have an amazing multiplier effect. The German army entered the Second World War with fewer tanks than the French yet was able to defeat the French army in a short campaign. The American army finished the final phase of the Persian Gulf War in 100 hours of ground combat, perhaps the swiftest ground campaign in history. These armies had doctrines that enabled them to use their tools more efficiently than their enemies and tools that allowed them to exploit the opportunities manoeuvre presented.

Canadian troops may discover themselves in the same predicament in future operations that their predecessors did in the 1940s. Even very poor third- and fourth-world nations

have stockpiles of armour and heavy weapons that could make movement under contact very difficult for troops mounted on LAVs, as suggested by war games. An Achzarit armed with a fire

and forget missile battery is a conceptual tool to imagine what a low cost and quickly available manoeuvre warfare fighting vehicle might look like, as well as pointing the way to a

vehicle and doctrine for the Army of the Future.



ABOUT THE AUTHOR...

Sergeant Arthur Majoor holds a business finance diploma from Fanshawe College and is currently enrolled in the Microsoft Certified Systems Engineer course. He joined the Canadian Forces in 1981 and served in the regular army until 1986, before transferring to the Reserve Force. His operational service includes a tour in Cyprus and disaster assistance during the Ice Storm in 1998. Sergeant Majoor is currently employed as the G6 IT Administrator with 31 Canadian Brigade Group Headquarters in London, Ontario.

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1. LCol (Ret.) Roman Jarymowycz, "On Doctrine-A Brief Comment," *The Army Doctrine and Training Bulletin*, Vol. 4, No. 3, Fall 2001, pp. 56-65. Jarymowycz has stated in several places (including a presentation at the 9th Military History Colloquium, which I was privileged to hear) that the Canadian Army achieved operational manoeuvre in closing the Falaise pocket, but at a considerable cost.
2. Major R.L. Mader, "Manoeuvrist Operations: Some Thoughts on Whether We Have Got It Right," *The Army Doctrine and Training Bulletin*, Vol. 4, No. 1, Winter 2000/Spring 2001, pp. 50-53. The Quarre de Fer exercises demonstrated that LAV combat teams with LAV "Armoured Combat Vehicles" lack the ability to manoeuvre under contact with enemy medium and heavy forces.

3. George and Meredith Friedman, *The Future of War: Power, Technology & American World Dominance in the 21st Century*, St Martin's Press, 1998. This book is typical in asserting the combination of advanced sensors, fire control and "smart" weapons will be the winning combination for the 21st century.
4. Shawn Carlson, "Boids of a Feather Flock Together," *Scientific American*, November 2000, pp. 112-114.
5. *Jane's Armour and Artillery*, 2000-2001, available at http://janes.mil.ca/data/yb/jaa/jaa2000/jaa_0199.htm accessed November 2001.
6. *Jane's Infantry Weapons*, 1999-2000, available at http://janes.mil.ca/data/yb/jiw/jiw2000/jiw_0808.htm accessed November 2001.
7. See Capt (N) Okros, "The Future Soldier," Symposium on the Non-Commissioned Officer in the Future Army, 28 June 1999, Queen's University, Kingston ON and Garth Turner, *2015: After the Boom*, Key Porter Books, 1996.
8. "Norway's Jeger units: light, fast and tough," *Jane's Defense Weekly*, 4 March 1998, pp. 28-30. The organization of Jeger units makes the company commander the "Landholder" of a designated area, with virtually unrestricted freedom of action. He will normally split his company area into platoon areas and delegate operations that will be carried out by at squad level.
9. *Jane's Armour and Artillery*, 2000-2001, available at http://janes.mil.ca/data/yb/jaa/jaa2000/jaa_0219.htm accessed November 2001.
10. The LeClerc uses an externally powered turbocharger to provide peak power in a compact diesel engine. Because the turbine spins at a constant speed, there is no turbo lag when accelerating, and the turbocharger unit can be used with the engine off as an auxiliary power unit and an engine and crew heater.

Introduction to *The Corporals' Report*

by Colonel Stu Beare, CD, Commander, 1 Canadian Mechanized Brigade Group

The Army is in transition, whether we appreciate it or not. Since the early 1990s, that transition has been driven by a post-Cold War reality and more recently by much overdue equipment modernization. In effect, change has been the consequence of external factors, not the actions of an institution that has designed and shaped its future. Our Army has recognized this reality and has taken significant steps to get ahead of external influences. This is being done on two fronts. The first is by refocusing and reorienting the institutional Army (focus of the Land Staff, creation of the Land Force Doctrine and Training System (LFDTTS), establishment of strategic concepts and planning directorates etc.) with a new investment in organizations that affect our future. The second is by creating the framework for designing and delivering the Army of Tomorrow, an army based on a balance of the needs for a future Army as well as our country's capacity to sustain and evolve the army as a warfighting institution.

The priority of effort in times of change is this: communicate, communicate, communicate. The Army has initiated a broad communication of our change agenda in the publication of the *Army Strategy: Advancing with Purpose*. While the framework for the implementation of the Army Strategy is set, methods for its implementation and details in terms of structure and capability outcomes remain flexible—to a degree. Every soldier needs to be aware of the environment that is affecting our army's future, understand the strategy we are pursuing to move forward, and to determine and affect his part in the way ahead. For as many of us wearing the army uniform there are views on the way ahead. If we are operating from the same professional foundation and are motivated by the same purpose, we should invite all members of our army to participate in the determination of that way ahead.

Two soldiers of our Second Battalion, Princess Patricia's Canadian Light Infantry have entered the arena of shaping our Army's future—constructively and in writing. Corporal W.C. Gomm and Corporal R.K. Moran of the battalion's intelligence section have studied key army literature, including most recently the *Army Strategy*. They have taken it upon themselves to offer a challenge to some of the views espoused in the strategy and its associated initiatives. While they admit to not having all the facts or factors affecting strategic decisions, their work in creating the enclosed "Corporals' Report" is notable for many reasons. They have elected to debate our future in a professional forum; they have invested personal time and effort to promote the well-being of our army as an institution; they have recognized that the Army lives in a world that we cannot control; they regard the army as an institution of importance beyond its

individual branches and units; and, they seek to tie the future of the army into the Canadian Forces as a national institution. And in their writing, these two cause us to reconsider many of the assumptions and perceptions that tend to limit our imagination and options for the way ahead. These soldiers forwarded their paper to our Army Commander for his consideration. He has personally commended them for their personal contribution and has directed that their work be published in our *Army Doctrine and Training Bulletin*.

The message here and the example provided by Corporals Gomm and Moran is to engage. Our army is seeking to get ahead of the evolving security environment, and to shape the Army's future as we remain a vital component of our nation's security. We all shape our future in one form or another—in the field, in our force development and training institutions, in setting the conditions for our sustainment and change, and, as done here by two soldiers, by participating in a professional dialogue on the way ahead. I said earlier that there are as many views on the way ahead as there are individuals in uniform. As we formulate our views, we need to keep these factors in mind: that we must take ownership of all the challenges facing the Army, that our perspective be holistic—that is neither unit, branch, nor component centric, and that we adhere to the purpose and ethos of our Army as inscribed in Canada's Army (B-GL-300-000/FP-000).

Whether your focus is on next month's training, next year's operations, or managing the day to day affairs of your part of the army, your engagement in understanding our army's environment and in shaping its future—locally or strategically—is key to our institutional and professional well-being. Well done to our authors! May your efforts stimulate the efforts of many more.



The Corporals' Report

by Corporal W.C. Gomm and Corporal R.K. Moran

The following paper is the joint work of two infantry corporals currently serving with the 2nd Battalion, Princess Patricia's Canadian Light Infantry Intelligence Section. They have witnessed over the years numerous attempts by personnel within and outside the Canadian Forces to revamp the military, usually with half-hearted decisions that offer partial solutions at best. Past authors of the various programs/ideas seem to be either unwilling or afraid to step on people's toes when making their decisions. Alternatively, they go the other route and come up with equipment that does not exist anymore.

BRIGADE IN BATTLE SCENARIO

A Canadian mechanized brigade has been miraculously deployed to a foreign country for military operations within a NATO-led attack. The Canadian brigade has been tasked with covering the left flank of the attack. Upon receiving their orders to engage the enemy and, if possible, break through the enemy lines, the brigade moves out and, within two hours, elements from brigade recce encounter the lead elements of the enemy. It appears the enemy is moving along the same axis of advance as the brigade. Seeing the enemy's intent, the brigade commander deploys his units to conduct a meeting engagement. Two battle groups are forward. The artillery deploys their M109 batteries along with their towed 105 mm howitzers to support the upcoming battle. The air defence anti-tank system (ADATS) that have somehow kept up are deployed to provide air support along with Javelins.

The battle begins, and the Canadians smash the oncoming enemy forces with minimal friendly losses. Seeing the sudden collapse of the enemy forces and receiving reports from brigade recce that the enemy is moving rapidly to their rear areas, the brigade commander realizes he has the

opportunity to deliver a crushing blow to the enemy and orders the brigade to quickly advance. The infantry battalions in their light armoured vehicles (LAV) IIIs charge down the axis of advance with the armoured assets struggling to keep up. Brigade recce reports that they have encountered prepared enemy positions, but they are not fully occupied. They also report that they (recce) are taking heavy casualties from unknown sources.

The brigade commander orders a hasty attack on the partially occupied positions using the same formations as used earlier, two battle groups forward. However, due to the rapid advance of the LAV IIIs and Leopard 1s, the majority of the artillery support has been unable to keep up. All the artillery has to provide indirect fire is their towed 105 mm howitzers. The brigade commander orders his infantry battalion commanders to deploy their 81 mm mortars to provide additional indirect support. The infantry commanders report that they have given up their 81 mm mortars to the artillery. The artillery then report that they did not bring the 81 mm mortars due to the fact they only had enough manpower to man their M109s and towed 105 mm howitzers.

So with very little artillery support, the commander orders the assault, and the enemy replies with tank launched missiles (AT-11 Sniper) and other anti-tank assets (BRDM-2, AT-5 Spandrel, AT-10 Stabber). Due to the extreme range that the enemy is firing from, the Leopard 1s are unable to engage the enemy, while the infantry battalions' tube-launched, optically-tracked, wire-guided (TOW) assets—assuming we even have LAV III TOW—are able to take out only the closest units before themselves being destroyed. At the same time, a flight of SU-25 Frogfoots rapidly approaches and engages the Leopard 1s and LAV IIIs with cannon and anti-tank missiles before

continuing on to cluster bomb the artillery battery position. Again, due to the rapid advance of the brigade, the ADATS that was unable to keep up is unavailable to engage the enemy aircraft. By the time the Javelins have made ready, the air sorties are over and the brigade has been reduced to 50% strength. Unable to fulfill the mission, the Canadians are forced to fall back to a defensive position waiting for resupply and recovery.

This engagement is completely hypothetical or sheer fantasy, depending how you look at it, as we are unable to deploy a complete brigade on short notice due to the wide variety of equipment within the brigade.

CANADIAN MILITARY HISTORY FROM KOREA TO PRESENT DAY

Canada's commitment to the Korean War effort was anything but spectacular: six ships, four transport planes and, eventually, an infantry brigade group. The first troops to land in Korea were from the 2nd Battalion Princess Patricia's Canadian Light Infantry. Never in Canadian military history had a unit been so ill equipped for battle. This seemed to be the norm for the rest of the conflict. Once in theatre, due to the poor equipment available to them, Canadian troops would trade with their American counterparts for weapons and clothing.

The rest of the army was not in that much better shape. Government neglect since the Second World War had seen the speedy decline of a once proud military. Around this time the Canadian public began to lose their interest in the military and its commitments overseas. Canada's commitment to NATO after its formation became smaller and smaller until all that was left was an understrength mechanized brigade and a small air division. As it turned out, the NATO commitment was the strongest post-

Korea formation that would ever be seen again in the Canadian Forces with the introduction of the M113 APC, the Leopard 1 tank and the armoured vehicle, general purpose (AVGP) series vehicles for use within Canada. The Canadian army still lacked the strong punch and numbers to carry out operations "with the best against the best," as it was asked to do by its NATO allies. Instead of acknowledging that it could not fight the battles asked of it and restructuring so that it would be able to do so, the Canadian army began to "rot" from within. The Canadian Forces Europe (CFE) land component 4 Canadian Mechanized Brigade Group (CMBG) was relegated to becoming Central Army's reserve. This was most likely done to keep the Canadian Forces employed in Europe.

Though the Royal Canadian Air Force presence provided a substantial force, it soon started to decline along the same lines as the army. With the introduction of the CF-18, the Air Force regained some of its combat capability, but failure to upgrade eventually lead to its decline. The Air Force did try to keep itself above water but was always stopped short by the government. Examples of this were the purchase of the CF-5 instead of better fighter aircraft that were available (e.g., the F4 Phantom), the purchase of only eight Chinook helicopters and the subsequent sale of them to the Dutch because of their unforeseen high operating costs, and the replacement of the twin-engine Huey with the Griffin, which only had half of the required lift capability, instead of a better available helicopter (e.g., the US produced Black Hawk).

The Army did not fare any better. It seemed to stagnate. Centurion main battle tanks (MBTs) that seemed to have nothing but problems were replaced by Leopard 1 tanks. Though not a bad tank, the Leopard 1 was meant to be more of an intern tank/recce tank until a better MBT could be produced/procured. The M113, a good APC for its time, was kept in front line service too long. The M109 was a good indirect weapon when it was originally introduced, but with the lack of upgrades, it too has decreased its

effectiveness. However, not all is doom and gloom. The introduction of the Bison, Coyote and LAV III were all good choices. As was the Tactical Command, Control and Communications System (TCCCS).

Obviously, this is not a comprehensive history, but a very quick look.

THE FUTURE AS WE SEE IT FOR THE INFANTRY, ARTILLERY, AND ARMOURED REGIMENTS ALONG WITH THE REST OF THE ODDS AND SODS WITHIN THE BRIGADE

To move into the future as a fully, though limited, operational/expeditionary force with full peace keeping/making capabilities plus the ability to air/sea lift our forces without having to use foreign/rented equipment, drastic changes will be required throughout the brigade and the army as a whole. Some of these changes will involve equipment and personnel, while others will involve the training of personnel from basic training to career advancement and career courses. We will touch on the linguistic problem that has plagued the military for years. We will also attempt to fill the vacancy left by the disbanding of the Airborne Regiment by replacing it with a more tangible and effective fighting force.

There have been numerous plans written in the last few years with various proposals on how to restructure the Canadian Army. One plan calls for all the Leopard 1 tanks to be placed under the control of Lord Strathcona's Horse (Royal Canadians) (LdSH[RC]) with reconnaissance squadrons filling the ranks of the other armoured units, thus stripping those other units of their tanks. The rest of the plan involves the reorganizing of the three "mechanized brigades" by removing their mortar and pioneer platoon assets.

"Great Idea"

Stripping all the other armoured units of their tanks to form a one-function unit would, in turn, result in one of the CF's brigades having an armour capability. As for the mechanized brigades, we turned all our

mechanized vehicles in when we got our LAVs. Stripping the infantry battalions of their integral indirect fire and pioneer capability without some form of replacement results in the downgrading of the infantry's effectiveness.

Another plan written by Brigadier-General G. Nordick and published in the *Armour Bulletin* includes the following:

- The reorganization of the LdSH(RC) into a Russian-style tank battalion, using four squadrons of 10 tanks per squadron to form the battalion, while the other two regiments would get one squadron each.
- Along with 5^e GBMC recce squadron mounted in Coyotes (with an integrated anti-tank system), the reallocation of recce squadrons with one squadron going to the LdSH(RC) and the rest split between The Royal Canadian Dragoons and 12^e Régiment blindé du Canada.
- The creation of three additional recce observation squadrons, one per regiment.
- The creation of heavy anti-tank squadrons equipped with 8-12 LAV TOW by stripping them from the infantry battalions (replacing them with a weapon system capable of firing 2000 m). These heavy anti-tank squadrons would then be allocated to the brigades as a formation asset. As well, four ADATS would be drawn from the air defence regiment for use within the brigade.

Another "Great Idea"

Going to the Russian-style tank squadron/battalion would limit the brigades' armoured capability by drastically reducing two regiments to make one. The armoured regiments, which are supposed to have four squadrons of 19 tanks each plus two command tanks for a total of 78 tanks, would then be reduced to 40 tanks. The reduction of the armoured regiments in size and equipment is the right idea, but we think this is the wrong way to do it.

Creating five brigade recce squadrons along with recce observation squadrons does have some merit but does not go into enough detail. Integrating an anti-tank capability into the Coyote weapons system has been proven by the Americans with their Bradleys to be a failure; they are now removing their TOW launchers from their vehicles. The brigade recce squadron is a reconnaissance asset not an anti-tank asset. Recce has enough problems staying alive on the battlefield as a viable asset while scouting the enemy for the brigade commander without having to perform anti-tank roles.

Stripping the infantry battalions of their TOW assets just reduces the infantry's fighting capability. But even if this plan was followed through, as bad as it is, keeping an outdated weapons system like the TOW when better systems are available is ludicrous. Re-equipping the infantry with a 2000 m+ weapons system does have some merit but again does not offer enough detail.

The main problems with these two plans and many others like them are that they are based on outdated ideas and battle plans that never had a chance of succeeding. For a great many years, even decades, the Canadian army and its leadership have based all their plans on winning a major land battle set on a European battlefield with full combat-ready brigades. We have never had full combat-ready brigades. Even with 4 CMBG in Germany, we were at best a third-line unit. With the basic recent upgrades to the Canadian army, we have improved somewhat. But we are nowhere near a combat ready force and never will be. For example, the Leopard tank is not an MBT and never will be; at best, it is a medium tank, and with the recent turret upgrades, it is now basically a 105 mm-gun platform. As well, the TOW system has seen its day. Wire-guided missile systems are a thing of the past, and with only a range of 3750 m, it is far too short a range to engage today's MBTs without being destroyed by direct fire.

Other problems with these plans are that they are usually limited in their scope. Brigadier-General Nordick's plan only deals with the infantry and

armoured units, while other plans only cover up to the brigade level and a very few plans call for higher reforms. All of these plans overlook the main obstacle to solving the problems of the CF: money. The defence budget will always dictate the outcome of the CF. So what's the point in planning for new equipment unless we sell some of the old equipment or the military wins the lottery?

Instead of concentrating on equipping the army for a full combat-capable role—which, as we have previously stated, has never existed and our Allies know we don't currently have the capability to fulfill such a role—why don't we reorganize our armed forces into a fighting force that our NATO allies will be able to use? Such a fighting force would fill a niche requirement within NATO and on the future battlefield. It would be able to either airlift or sealift its forces to anywhere in the world with a minimum amount of work-up training. We would no longer pretend to be something we are not. Instead of fighting the land battle, we would be used on the battlefield as a quick reaction/exploitation force that would be capable of moving quickly through the "gap." With a fully equipped brigade, such a quick reaction/exploitation force would be capable of exploiting the enemy's rear areas with direct fire, long-range missile attack, and artillery support and would still be able to defend itself.

FIRST, WE MUST REMOVE UNNECESSARY EQUIPMENT FROM WITHIN THE REGIMENTS.

To achieve this aim we must reorganize in the following ways:

1. Within the infantry regiments, we must first drop the light battalions, leaving two motorized battalions. To do so, we must
 - a. remove all Coyote recce vehicles from the infantry recce platoons;
 - b. get rid of the TOW under armour (TUA) capability . . . **and sell them;**
 - c. turn in all the 81 mm mortar systems . . . **and sell them;** and
 - d. turn in all the Eryx systems . . . **and sell them.**

2. We must reorganize all the armoured regiments into armoured battalions, turning in all the Leopard 1s and variants...**and selling them.**
3. We must reorganize all the artillery regiments into artillery battalions. To do so, we must
 - a. turn in all the M109 155s... **and sell them;** and
 - b. turn in all towed 105 mm howitzers . . . **and sell them.**
4. We must disband the air defence regiments. To do so, we must
 - a. turn in the ADATS... **and sell them;**
 - b. turn in all the 35 mm Oerlikons...**and sell them;** and
 - c. turn in all the Javelins ...**and sell them.**
5. We must also reorganize brigade recce by removing all the Coyotes.

Selling all of this equipment will raise much needed cash to re-equip the army with better vehicles.

From here on we would begin to reorganize the brigades so that they become a close-knit formation capable of completing the tasks/missions that are envisaged for the future of the army. Some of the equipment we would like to use already exists within the CF but is in need of upgrades to improve mobility/fire-power, while other equipment will be new purchases based on the LAV III chassis.

MOTORIZED INFANTRY BATTALION

To make the infantry battalion a viable fighting force, it would need the following upgrades.

With the loss of the Coyote, the recce platoon would need a replacement vehicle to fulfill its role in the infantry battalion. To solve this problem, we would reintroduce the Grizzly AVGP and convert it into a reconnaissance asset by upgrading the suspension system, removing the crew commander's position and upgrading the turret. The turret upgrade would use the turret currently in production

by Textron Systems for the Swiss: it consists of a .50 cal and a 40 mm grenade launcher (Annex A). Adopting this turret would give recce the capability to provide suppressive fire while the main force moves up. With a crew of five (driver, gunner and a three-pers dismount section) this AVGP would bring the recce platoon back to its main role—mounted and dismounted ops within the battalion Area of Responsibility.

With the removal of the TUA, the anti-armour platoon would need a replacement system that is better than the TOW missile. The obvious choice is the Hellfire turret system, which has a range of 8 km, fire and forget capability, and can be mounted on a LAV III chassis.

With the removal of the 81 mm mortars and mortar dragon carriers, the infantry battalion would lose its indirect fire capability. This capability will be addressed within the artillery battalion.

The removal of the Eryx within the infantry companies would not be all that bad due to its limited range and wire-guided limitation. We would replace the Eryx with the US Javelin fire and forget missile system at a rate of two systems per platoon within the weapons detachment (det). We would keep the 84 mm Carl Gustav within each section but switch to the composite version and purchase a better telescopic sight and improved ammunition. An armour-piercing, fin-stabilized, discarding sabot (APFSDS) round with a range of 1000 m(+) and other enhanced munitions for the Carl Gustav would be ideal. We would remove the 60 mm mortar from the infantry platoon's weapons det and reform the mortars into a three-tube mortar group, consisting of seven personnel (three crews of two and one commander), using a BISON as the mortar carrier under the command of company headquarters. The rifle companies would remain with their current allotment of LAV IIIs.

The only other change within the infantry battalion would be of the reorganization of the administration company. Currently a lot of the

positions within in the company are filled with MOC 031 infantry. These personnel could be better used within the rifle/combat support companies. The administration company should be led by a logistics major. Transport platoon would draw personnel directly from service battalion, and the other organizations would be filled with trades specific to their own specialties.

ARMoured

In order to make the armoured battalion within the brigade a force to be reckoned with on the battlefield after the removal of the Leopard 1 medium tank—it must be understood that the Leopard 1 is in a reality a 105 mm gun platform—a wheeled vehicle with a 90–105 mm main gun would be the way of the future. Corporal Cushing's article in the *Armour Bulletin 2002* talks about the future of the armoured forces by switching to a LAV based 105 mm gun system. This is the same idea that we have but in greater detail. We have chosen the LAV-105 turret, which uses the M35 gun system. This turret can be mounted on the LAV III (Annex B).

With the removal of the Coyote reconnaissance vehicles from the infantry recce platoons, a composite, fully equipped observation/recce squadron could be formed with enough assets left over to form the same squadrons to be left in place on overseas missions without damaging the operational effectiveness of the Canadian-based brigades. With this in mind, we would reorganize the armoured battalion so that each squadron would consist of fourteen vehicles in the following way:

- a. three LAV III-105 squadrons (at the very minimum two); and
- b. one Coyote observation/recce squadron.

Brigade recce would be completely separate from the armoured battalion.

ARTILLERY

Like all other major units, the artillery regiment within the brigade must be able to quickly move

with the brigade in order to provide integral indirect fire. We believe that a new system that is capable of providing indirect and direct fire would be the ideal solution. We have decided on the Delco Defense/RO Defense 120 mm Armoured Mortar System (AMS), a breech-loading turret mounted on a LAV III (Annex C). With the employment of the LAV 120 mortar systems, we would reconfigure the artillery battalion into three LAV 120 mortar batteries (a battery will still consist of five systems) and we would allocate one LAV 120 mortar battery to each infantry battalion (note there are only two infantry battalions in each brigade) for a total of five LAV 120 batteries.

The removal of the 81 mm mortars from within the infantry battalions drastically reduces the infantry's firepower on the battlefield. We believe that this would be a serious mistake, but we also believe that the mortar system should be an artillery asset. To solve this dilemma, we suggest that the artillery assumes the duties of the mortar platoon and replaces it with a LAV 120 battery. However, for ease of training and deployments, this battery should become a permanent part of the unit, completely manned by artillery personnel but part of the infantry battalion. This would, in essence, result in keeping both sides happy.

AIR DEFENCE

The disbanding of the air defence regiment and the removal of all air defence assets does not mean the end of the Canadian Army's air defence capability. Except for the recent deployment of ADATS for the G8 summit, the greatest role the ADATS plays within the CF is dog-and-pony shows. This is the same for the 35 mm Oerlikon anti-aircraft gun, which is also used in dog-and-pony shows and firepower demonstrations. While the Javelin's primary use is in the dismounted role from either the back of a Grizzly or dismounted from a light support vehicle wheeled (LSVW), both of which provide next to no protection for the crew. From a quick moving LAV-equipped brigade perspective, the Javelin proves to be inadequate.

AIR DEFENCE SQUADRON

Within the brigade, air defence should reform as an air defence squadron of eight vehicles organized into four two-vehicle troops. To accomplish this, we suggest using the LAV air defence system, which is a LAV III with a turret configuration of two banks of four missiles each with a 25 mm Gatling gun in the centre (ANNEX D).

MILITARY POLICE

Presently within a brigade, we have a military police platoon. The majority of these military police are used for police taskings, not the roles they should be filling, such as traffic control posts and camp security. We believe that the military police should be reorganized into a military police company.

MILITARY POLICE COMPANY

A military police company would consist of three four-vehicle platoons with a headquarters element. Each platoon would be given two Grizzly AVGP and two GM Brute 4x4s, with four personnel per vehicle, while the headquarters would get 1 GM Brute. Like the infantry recce, the Grizzly would have its suspension improved and an improved twin .50 cal turret. The GM Brute, which is the best choice as a replacement for the ILTIS and LSVW, would be armed with a top mounted 40 mm grenade launcher.

BRIGADE HEAVY ARTILLERY (MLRS)

There is a need within the brigade for a long-range artillery capability that is motorized like the rest of the brigade. At this time, there are some wheeled 155 mm systems, but they lack the range needed for counter-battery and long-range bombardments. For these functions, a wheeled multiple launch rocket system (MLRS) is required. At the present time, no such system exists, but if one were requested, someone would build it. We suggest one battery of six wheeled MLRS per brigade, using a turret-less LAV 10 x 10 equipped with two stacked banks of 140 mm rockets that have a minimum range of 40 km and a maximum range of at

least 60 km and capable of using a variety of ammunition including high explosive (HE), improved conventional munition (ICM), and scatterable mines. It would have to have a reload vehicle along the lines of a heavy logistics vehicle wheeled (HLVW), which would be capable of carrying two reloads per system. It would have a crew of three: driver, commander and gunner.

BRIGADE RECCE

Brigade recce is still required but with a much more radical approach. Recce should be considered a "special force" within each brigade, manned by volunteers from all ranks/trades within the brigade. It would be a quick and highly maneuverable force with the ability to rapidly disengage from almost any situation and capable of identifying enemy positions, lazing targets and calling artillery in while still accurately reporting what is seen.

Brigade recce would consist of one squadron of four four-vehicle troops and a headquarters element of two vehicles. The vehicle of choice would be the fast attack vehicle (FAV), a strong but light vehicle based on a composite steel tubular frame with a tandem seating arrangement for two personnel, a diesel engine (with a large fuel tank), and using the same tires as the GM Brute. The gunner would sit behind the driver in an elevated position. A state-of-the-art day/night optic system would be employed. The main armament would be twin-mounted 7.62 mm general purpose machine-guns (GPMGs), and crew armament would be two C8s with M203 grenade launchers.

AIR ASSETS

The brigade should have its own internal air asset/recce capability without having to rely on the Air Force. As the Griffon is not much of a troop transport and more like an air taxi within the CF, we should convert it into something more useful to everyone. Therefore, we suggest the Brigade Air Recce/Observation should consist of one squadron (6) of Griffon helicopters reconfigured with the following:

- a. two banks of HellFire II missiles, one bank on each side;
- b. two banks of Stinger missiles (air defence); and
- c. a fire control system capable of using the HellFire and Stinger.

This concludes the reconfiguration of the brigade. This reconfiguration would be the same for all three brigades.

The brigades would be renamed as follows:

- a. **Brigade West in Edmonton;**
- b. **Brigade Central in Petawawa; and**
- c. **Brigade East in Valcartier.**

REGIMENTAL SYSTEM

We understand that of this entire essay, this will be the part that will bring the most amount of general displeasure among the military flag huggers. It is our belief that the regimental system in the Canadian military should be changed to a numbered regiment system. We suggest that everyone in the infantry be a Canadian infantryman not a Patricia or Royal or Vandoo. We could all go to one hat badge and have a regimental number in the centre (e.g., a maple leaf hat badge with a number). The RCR would become the 1st Canadian Infantry Regiment, The PPCLI the 2nd Canadian Infantry Regiment and the R22^eR the 3rd Canadian Infantry Regiment each with two battalions.

Some will say that this will destroy the integrity of a unit. One must remember, though, that in the First World War, the Canadian Corps was made up of mostly numbered battalions. There was no time to instill tradition or thoughts of regiment in these units. Yet, they fought as hard as any other during the war. These men signed up to fight for their country and did this very well.

One of the great strengths of the army in the First World War was that it was a citizen's army not a regular standing army. What has also been said before in so many words is, "Do you think that someone from the Kings Canadian Mountain Rangers would

fight harder than someone from the 2/5 Infantry Regiment?" The answer of course is "no." Canadian soldiers do not fight for their regiments but for the soldiers around them and hopefully for their country.

We also believe that we could move to the Australian system of just one regiment for infantry, RAR (Royal Australian Regiment), made up of many battalions. This way there would be the need for only one regimental headquarters, etc. Possible names for all infantry could be The Canadian Infantry Regiment, The Royal Regiment of Canadian Infantry or The Royal Canadian Regiment.

The armoured and artillery regiments would revert to battalions using the same numbered system as the infantry. (1st Canadian Tank Battalion and so on).

The loss of the Airborne Regiment in the mid 1990s and our removal of the light battalions from within each brigade leaves a large gap in our military formation. To counter this loss, we believe the formation of an airmobile battalion within the CF is a viable option, though there would be some very difficult problems to overcome due to the nature of our country and its internal policies. The operating language in NATO is English; therefore, anyone in an airmobile unit would have to be bilingual. We believe a five-year grace period should be given to make sure everyone in the unit would be given enough language training to overcome this large problem (this problem will be addressed in the section on training below).

AIRMOBILE BATTALION

An airmobile battalion would be configured as follows:

- a. four rifle companies (total of 110 soldiers), each of which would consist of:
 - i. a company HQ, including:
 - a) a company commander,
 - b) a company 2 IC,
 - c) a company sergeant major, and
 - d) two signallers/close security¹; and
- ii. three platoons, each of which would consist of:
 - a) three sections, including:
 - i) a sergeant IC,
 - ii) a master corporal 2 IC,
 - iii) four rifleman (two with M203),
 - iv) two C9s, and
 - v) a two-person anti-tank weapon (Javelin); and
 - b) a platoon headquarters, including:
 - i) a platoon commander/signaler,
 - ii) a platoon warrant officer,
 - iii) a platoon medic, and
 - iv) a C6 machine-gun (two pers crew);
- b. a combat support company (-), which would be a recce platoon (total of 35 soldiers) consisting of:
 - i. six dets of four soldiers each,
 - ii. two dets of four snipers each,
 - iii. a platoon commander/signaler,
 - iv. a platoon warrant officer, and
 - v. a medic;
- c. a mortar platoon (18 soldiers), which would consist of:
 - i. six 60 mm mortars split into two three-tube groups (two soldiers per tube),
 - ii. a platoon commander/signaler,
 - iii. a platoon warrant officer,
 - iv. two group commander/line NCMs, and
 - v. two command post officers;
- d. an air defence platoon² (total 16 soldiers), which would consist of:
 - i. three Stinger sections, each broken down to two two-pers dets;
 - ii. a platoon warrant officer; and
 - iii. three NCOs;
- e. a logistics platoon, which would consist of:
 - i. a supply section,
 - ii. a transport section,
 - iii. a signals sections, and
 - iv. a medical section; and
- f. the battalion headquarters, which would include:
 - i. a commanding officer,
 - ii. a deputy commanding officer,
 - iii. an operation officer,
 - iv. an adjutant,
 - v. an intelligence officer,
 - vi. a battalion sergeant-major, and
 - vii. signaler/close protection for all of the above.

As an airmobile battalion within the CF, there would be a definite requirement for a lift capability to transport the battalion with a complement force to safeguard the unit in the air and to later support it once on the ground. To fulfill this requirement the battalion would need the following:

- a. enough Blackhawks (or similar helicopters) to lift the entire battalion;
- b. two attack helicopter squadrons (six helicopters per squadron), using a helicopter such as the Super Cobra equipped with Hellfire II and 20 mm canon; and
- c. one recce squadron of four Griffons equipped with Hellfire II and Stinger.

To instill esprit de corps within the airmobile battalion, all soldiers, airmen and helicopters, along with any other members attached to the unit, would be considered part of the battalion.

THE AIRMOBILE BATTALION WOULD BE STATIONED IN WINNIPEG ON THE NORTH SIDE.

Due to the nature of such an airmobile battalion, there would be very little equipment except within the air assets. This would fit in nicely with an air base. Winnipeg is a central location within Canada, which would allow an airmobile battalion to move in any direction with little warning. Within short flying distance there is a very good training area, which is well suited for dismounted operations.

This concludes the army portion of the revamping of the Canadian Forces. We would now like to turn our attention to the Air Force proper and the Navy.

AIR FORCE

Originally, the CF-18 purchase gave us an up-to-date fighter/bomber; but, due to a lack of funding, (a typical problem in the CF), the CF-18 has become out-dated and ineffective in most of the roles it was designed for. About the only mission it can fulfill today is sovereignty flights. Unless a lot of money is put into the CF-18, there is no real reason to keep the numbers we have flying.

So here lies the problem: do we keep an aging fighter/bomber with growing limitations that we are unable to upgrade, or do we switch to a more economical aircraft, preferably already in service or in storage (e.g., CF-5)? At the start of this plan, we acknowledged our army's limitation to conduct the land battle. We can support someone else, but that is about it. So we must come to the same realization for the Air Force.

Instead of CF-18s, we suggest purchasing the F-16 Fighting Falcon. Right away, we can here the grumbling that the F-16 is only a single engine fighter. Anyone who follows any kind of air force related subject knows that the F-16 is one of, if not the best, single-engine jet fighters in the world today. The F-16 is light, fast and maneuverable. This agile little fighter can also be converted into a strike fighter with a lethal payload. It would be the perfect all-round aircraft for the Air Force. Failing the purchase of the F-16, we could always fall back on upgraded versions of the CF-5 or the F-20 Tiger Shark. Both are economical fighters and will easily fill the operational requirements of the CF. We suggest that there be three ten-aircraft squadrons. These squadrons would be located at Comox, Cold Lake and Bagotville.

At this point in time, Canada's only heavy lift capability is the C-130 Hercules. We believe that the twenty that are allocated to SAR duties should be kept and, if possible, upgraded to extend their service life. We submit that a squadron of approx eight heavy lift aircraft should be purchased. The idea behind this heavy lift capability is that the CF would not have to rely on others to move our ground formations. It would save us from anymore Afghanistan-style embarrassments. Two good choices for this heavy lift capability would be the C-17 Globemaster or the C-141 Starlifter.

NAVY

At the present time, we have a good Navy considering the size of the country. The only problem is we have more ships than personnel to crew

them: we have four destroyers, 12 frigates (of which, we can barely crew half), two supply ships (one on each coast), 12 maritime coastal defence vessels, some used subs, and a number of miscellaneous small vessels. In addition, we have numerous aging helicopters, which are due to be replaced soon, we hope!

We should reduce the number of frigates to six, with three on each coast. To figure out which ones are paid-off and sold (make more money), we should take the mayor of each ship's namesake city and let them draw straws. Whoever gets the six longest ones are the ships we keep. Additionally, we should:

- keep the supply ships where they are;
- keep the subs and hope there is some way to make them operational;
- purchase four roll-on roll-off ships, to be used as transport for the mobile brigades with a secondary role as supply ships, and put two ships on each coast;
- keep two mine sweepers on each coast (this assumes we have mine sweepers); and
- purchase 16 river patrol boats (eight for each coast), which can easily be transported by sea or by air to be used anywhere the CF requires them.

TRAINING

Language

Reorganizing the CF without reorganizing some of our training methods would not be overly smart. We call ourselves a bilingual army, but in reality, we are two separate armies, one English and one French. This is due in part to geography and in part to our regimental system. We only offer language training at the junior NCO level with a basic course before moving them up to a full one-year course later in their careers.

Example No. 1. A warrant officer is sent on a one-year French course, and upon graduating, we keep him in his parent (English) unit. By keeping him

within his parent unit, within one to two years he has lost all the French language skill that he had acquired. **A complete waste of time and money.**

Example No. 2. A sergeant is sent on a one-year French course but fails/quits. Nevertheless, he still gets promoted. **Another waste of money that could have been better used.**

Solution

Language training should be started as soon as the new recruits hit basic training. Their first language should be brought up to speed, then they should receive their second language training. This language training should continue all through their training, even at their basic trades training level. Once posted to their units, members should have the resources available to continue their language training. Once members pass a one-year course and are deemed bilingual, they should be given the opportunity to make use of their training by being posted to an area where they would use their second language.

Make the One-Year Language Course a Career Course

Like all other career courses, if a member quits, it has serious career implications; if the member fails, however, she/he is not allowed to progress further up the ranks.

Physical Training

The Canadian Forces, especially the combat arms, should come up with a standard physical training plan and stick with it. From our perspective, the plan that involves the 13 km march, combined with ammo crate lifting, shoveling pea gravel, etc., is a good plan. However, due to legal hurdles, the army has been unable to fully implement this program at this time. It is a well thought-out program designed by military and civilian physical fitness experts.

Officer Training (Infantry)

Too many times within our careers, we have seen young officers join the infantry and proceed to spend one to

two years as a platoon commander, during which time they spend, at best, one year in the position while the rest of the time is spent on courses or other duties. They are then promoted to captain and spend a year in either administration or combat support company. Based on the fact that the best training a young officer will ever get is as a rifle platoon commander. And the little amount of time they spend as one is considered a waste of money and training.

To improve the knowledge and training within the infantry officer corps, we suggest that infantry officers do the following once they have passed Phase IV:

- a. They should spend the first two years at the rank of 2 Lt/Lt as a platoon commander.
- b. Upon the successful completion of those two years, they should be evaluated. Those who meet

the standard and are suitable to be promoted to captain should be promoted and posted to the airmobile battalion as a platoon commander. The remainder should stay in rank for another year to gain more experience before promotion to captain then kept as a platoon commander for another year. From there, they can progress through the rest of the officer rank structure.

The whole point of these proposals is to give young officers as much experience as possible leading soldiers at the platoon level before progressing. Anyone who shows superior talent, should be moved into the airmobile battalion for more experience.

CONCLUSION

As we are members of the infantry, our experience lies primarily within the infantry. We have limited

knowledge of the artillery, armoured, and air defence regiments. For the same reason, we have not discussed the combat engineer regiments. Our knowledge of the Air Force and the Navy is severely limited, but we do have some ideas for both. On top of everything else, we are ignorant of the costs involved in our plan, but we believe the selling of some equipment would offset the purchase costs of the replacements and the overall savings to the supply system should be enormous. By moving to a primary vehicle chassis, the efficiency of the supply system would be drastically increased. Cost savings would be enormous, training of mechanics would be simplified, and battlefield repairs would be a lot less difficult.



ABOUT THE AUTHORS...

Corporal W.C. Gomm joined the Canadian Forces on December 29 1982. He has served with the 1st Battalion, Princess Patricia's Canadian Light Infantry, during which time he served in Cyprus, and with the 2nd Battalion, Princess Patricia's Canadian Light Infantry, when it was stationed in Germany. Upon returning to Canada, Corporal Gomm became the 2 PPCLI Battalion Photographer. As the photographer, he served another tour in Cyprus (1990) and Croatia (1993). He was then posted to the Infantry School, where he was employed in Training Aids/School Photographer/IS Cell. During this time he also worked as the "Through Sight Video Operator" on numerous Eryx missile serials. In the spring of 1999, he returned to 2 PPCLI. He enjoys computer-based war games such as "Steel Panthers."

Corporal R.K. Moran joined the Canadian Forces on August 4 1983. Upon completion of training, he was posted to the 2nd Battalion, Princess Patricia's Canadian Light Infantry, where he has served since. In 1984, he moved with the battalion to West Germany and returned in 1988. His other tours include Namibia (1989), Cyprus (1990), Croatia (1993) and Bosnia (2002). He has held many positions throughout the battalion and, since 1999, has worked in the intelligence cell. Corporal Moran has an interest in military history.

ENDNOTES

1. There is no requirement for a company quartermaster, as the CSM or platoon WO would draw supplies directly from the logistics platoon.
2. Due to the nature of this unit, ammunition resupply, especially the 60 mm Mortar, C6 and C9 machine-guns, will be a serious problem. To rectify this problem, every other pers within the rifle companies will carry one 60 mm mortar bomb, while the other pers will carry additional C6 and C9 ammunition. If possible, extra Javelins and Stingers should also be carried.

GRIZZLY TURRET

WILMINGTON, Mass.—(BUSINESS WIRE)—April 8, 2002—Textron Systems announced today that its Marine & Land Systems Operations has been awarded a contract by MOWAG, Motorwagenfabrik AG. of Kreuzlingen, Switzerland for a quantity of 16 Cadillac Gage(TM) 40 millimeter/50 caliber turrets. The contract's dollar value is undisclosed but includes associated training, spares and logistics support. MOWAG intends to integrate these systems into their Piranha III 8X8 amphibious vehicle that is in use by various militaries and police agencies worldwide. This specific order is being manufactured and integrated into the Piranha III for a vehicle contract with the Spanish Ministry of Defence.

Clay Moise, vice president, business development, Marine & Land Systems Operations, Textron Systems, said, "This win not only demonstrates our ability to design and build innovative weapon systems, but offers greater protection and added capabilities for U.S. military and NATO forces as well. We are pleased that the Spanish Government specified our product, thus allowing us this opportunity to work with MOWAG."

The 40/50 turret weapon station is an improved version of the U.S. Marine Corps' Up-gunned Weapon Station (UGWS) and incorporates UGWS components. The UGWS was originally designed and developed by Textron Systems/CGT with more than 340 units produced for the Marine Corps and has proven to be a reliable and durable one-man turret system. The upgraded turret incorporates proven, tested and fielded components from the UGWS system into a dedicated, ballistically improved, ergonomically enhanced turret with a reduced silhouette. It is currently being manufactured for Textron Systems' Armored Security Vehicle that is now in production for the United States Army. This latest order allows Textron Systems to take full advantage of the production line already in progress.

Specific modifications to the UGWS configuration include the elimination of the greenhouse dome that has the effect of reducing the silhouette and offering improved air transportability. The new flat roof allows for the employment of a composite armor system that provides the crew with 360 (degree) protection from 7.62mm AP, 12.7mm AP and 14.5mm horizontal threats plus 155mm artillery fire overhead protection at 15m. This turret system also includes provisions for nuclear, biological and chemical survivability (NBC) including adaptations for an NBC overpressure system.

The work will begin immediately and delivery is expected to be completed by the 3rd quarter of 2003. The work will be performed at the Marine & Land Systems Operations manufacturing facility in New Orleans, Louisiana.

About MOWAG www.mowag.ch

MOWAG Motorwagenfabrik AG in Kreuzlingen/Switzerland designs develops and produces high-tech specialized armoured wheeled vehicles for military markets. Thousands of vehicles from the overall successful PIRANHA family are in service worldwide. Apart from the production at the company's headquarters in Kreuzlingen, these vehicles are also produced under license by leading companies in other countries.

About Textron Systems www.systems.textron.com

Textron Systems, a wholly owned subsidiary of Textron Inc., provides innovative technology solutions to meet the needs of the global aerospace and defense industries. The company supports military precision engagement and dominant maneuver with strike weapons, mobility and surveillance systems. The Textron name is well known in the areas of advanced weapons, surveillance systems, aircraft control components, specialty marine craft and armored vehicles.

About Textron Inc.

Textron Inc. (NYSE: [TXT](http://www.txt.com) - [news](http://www.txt.com)) is a \$12 billion multi-industry company with more than 51,000 employees in 40 countries. The company leverages its global network of businesses to provide customers with innovative solutions and services in industries such as aircraft, fastening systems, industrial products, industrial components and finance. Textron is known around the world for its powerful brands such as Bell Helicopter, Cessna Aircraft, Kautex, Lycoming, E-Z-GO and Greenlee, among others. More information is available at www.textron.com.

(c) Copyright 2002 Textron Systems Corporation

Manufacturer: Saco Defense Industries
Length: 43.1 inches (109.47 centimeters)
Weight:
Gun: 72.5 pounds (32.92 kilograms)
Cradle (MK64 Mod 5): 21.0 pounds (9.53 kilograms)
Tripod: 44.0 pounds (19.98 kilograms)
Total: 137.5 pounds (62.43 kilograms)
Muzzle velocity: 790 feet (240.69 meters) per second
Bore diameter: 40mm
Maximum range: 2200 meters
Maximum effective range: 1600 meters
Rates of fire:
Cyclic: 325-375 rounds per minute
Rapid: 60 rounds per minute
Sustained: 40 rounds per minute
Unit Replacement Cost: \$13,758

Features: The MK19 40mm machine gun, MOD 3 is an air-cooled, disintegrating metallic link-belt fed, blowback operated, fully automatic weapon and is crew transportable over short distances with limited amounts of ammunition. It can fire a variety of 40mm grenades. The M430 HEDP 40mm grenade will pierce armor up to 2 inches thick, and will produce fragments to kill personnel within 5 meters and wound personnel within 15 meters of the point of impact. Associated components are: MK64 Cradle Mount, MOD 5; M3 Tripod Mount; and the AN/TVS-5 Night Vision Sight. The MK19 also mounts in the up-gunned weapons station of the LVTP7A1 model of the AAV and vehicle ring mounts.

Background: The MK19 was originally developed to provide the U.S. Navy with an effective riverine patrol weapon in Vietnam. A Product Improvement Program was initiated in the late 1970s resulting in the MK19 Mod 3.

HOME / Armor / Armor Update **MARINE ARMOR UPDATE**

Floro International presented its conversion mounting for CIS 40mm AGL in a Textron 1-meter Turret of PMC. At the 7th International Aviation Maritime & Defense show in Manila.

The Floro company (same owners as Floro Blue Printing...) exhibited a conversion mounting for the Textron Marine & Land Systems 1 Meter Turret of the Philippine Marine Corps V150 and V300 vehicles.

21 May 2001
FIC to Overhaul V150 LAV

Floro International Corporation has announced today that it will be participating in the competition for the repair and upgrade of the V150, V300 Light Armoured Vehicles (LAV) of the Philippine Army and Marines under the modernization program of the Armed Forces of the Philippines.

f l o r o will be teaming up with Singapore Technologies Kinetic to perform the work in **f l o r o** 's defense manufacturing plant in Tanay, Rizal.

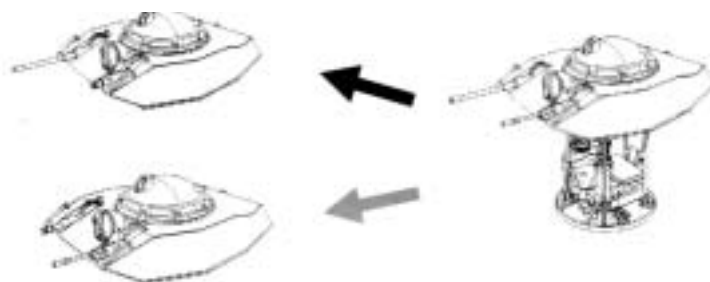
"All the work will be done in the Philippines to ensure that planned maintenance will be available for the vehicles during their expected lives",
according to Victorino Floro, Chairman.
<http://www.floro-intl.com/news.htm>



Left: Interior view of turret mount for 40mm AGL. <>> Right: Turret on loan from Marines
 Photos from *Defense Technology Monthly* May 2001

The turret was loaned by the Marines for proof and trials to fit a Chartered Industries of Singapore (Singapore Technologies) 40mm Automatic Grenade Launcher that has been purchased by the Armed Forces of the Philippines in limited quantities. <http://www.stengg.com/downloads/40agl.pdf>

The conversion can be fitted in lieu of the 7.62mm or 12.5mm machine gun on the left or right mounting cradles. It is not known if Floro will also be providing a periscope / gun sight with an aiming reticle for the 40mm trajectory. <http://www.floro-intl.com/aglupg.htm>



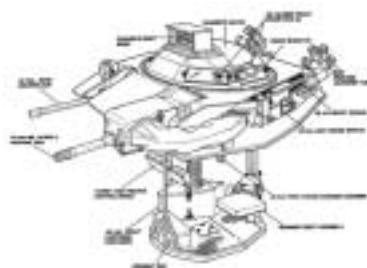
The V-300 vehicles had the option to be fitted with a 40mm AGL from the factory using the MK19 MOD3 40mm HMG manufactured by SACO in the USA. <http://www.fas.org/man/dod-101/sys/land/mk19.htm>



But this option and several others that included the winch, smoke grenade launchers, etc. were not included as a savings measure when the V-300 was selected for the US Military Assistance Program (MAP) grant for the Philippine Marines in the early 1990s.

The experience of the Marine armor in Central Mindanao showed that the AGL would have been a useful weapon.

The 40mm 1 Meter Turret has been seen on many occasions on the AAV-7s of visiting USMC units during the Balikatan and CARAT exercises.



CADILLAC GAGE (TEXTRON MARINE & LAND SYSTEMS) LIGHT ARMORED VEHICLE – ASSAULT GUN

105mm XM35 gun as the Government Furnished Equipment (GFE) weapon.

Following competitive bidding, in mid-1990 Cadillac Gage was selected to develop the Assault Gun Version of the LAV to meet the requirements of the US Marine Corps.

Under the terms Development

In December 1988, the US Marine Corps approved a requirement for an LAV-AG and selected the Benet Laboratory of the original fixed-price Full-Scale Engineering Development (FSED) 40-month contract, Cadillac Gage was to build three vehicles for delivery by May 1992 to the US Marine Corps for Development and Operational Testing.

Late in 1991 however, the US Marine Corps cancelled the research and development phase of the LAV-105 due to lack of production funding between FY93 and FY96 as Pentagon acquisition policy did not allow continued development of a programme unless there was assured production money.

At the time of cancellation, the LAV-105 was on time and within the fixed-price budget with first unmanned firings already completed.

In mid 1993, the US Navy released US\$33.8 million to allow Cadillac Gage to complete development and testing of the three prototypes of the LAV-105.

In June 1995, Cadillac Gage (now Textron Marine & Land Systems) completed development of the 105mm Light Armored Vehicle - Assault Gun (LAV-AG) for the US Marine Corps, although there is currently no funding for production vehicles.

The company is continuing to market the LAV-AG on the international market, especially the Middle East, and the turret is also being offered for installation on other chassis, wheeled and tracked.

Textron Marine & Land Systems has leased the three prototype LAV-AGs and their turrets from the US Marine Corps to enable marketing of the complete system and turret to continue.

Description

The LAV-105 is essentially a new two-man turret designed by Cadillac Gage installed on an upgraded 8 x 8 chassis supplied by the now General Motors Defense (this company was previously called the Diesel Division, General Motors of Canada). The chassis is similar to that used for the standard LAV, described in the Armoured personnel carriers (wheeled) section under Canada, but has additional buoyancy aids fitted either side of the turret towards the rear and a different roof arrangement because there will be no hatches in the roof of the vehicle at the rear.

The all-welded steel turret is armed with a 105mm Watervliet Arsenal M35 (development designation XM35, which is also installed in the United Defense LP full-tracked M8 Armoured Gun System) lightweight gun, which is fed from a bustle-mounted FHL automatic loader that holds eight rounds of ready use ammunition with additional rounds being carried in the hull.

The 105mm gun is fitted with a muzzle brake and thermal sleeve and can fire all types of 105mm ammunition including the latest armour-piercing fin-stabilized discarding-sabot (APFSDS) types. The empty cartridge cases are ejected out of the turret rear through a trap door.

A 7.62mm M240 machine gun is mounted coaxially with the 105mm gun and a bank of four electrically operated M257 smoke grenade launchers mounted either side of the turret firing forward. Provision is made for the installation of a 7.62mm or 12.7mm machine-gun on the turret roof.

The turret features an HR Textron (previously Cadillac Gage Control Systems) electromechanical gun/drive system in combination with a Computing Devices Canada digital fire-control computer.

Turret traverse is a full 360° with weapon elevation from -8 to +15°. Trials have shown that the LAV-AG can engage stationary and moving targets with a high first round hit probability while the vehicle itself is stationary or moving.

Both the commander and gunner are provided with a single-piece hatch cover that opens to the rear. The vehicle commander is seated on the left and has four day periscopes and a thermal day/night remote monitor. The gunner, seated on the right, has a stabilized Raytheon Day/Night Range Sight (DNRS), four observation sights and a back-up periscope.

The Raytheon DNRS comprises five key subsystems: Raytheon Infra-Red (HIRE) 240-line common thermal image with dual field of view, Raytheon laser rangefinder, Raytheon Line of Sight Stabilization Platform (LSSP), commander's remote display for viewing the day and night sight images with commander override for all the gunner's controls, and the Line of Sight Electronics Unit (LOS-EU). The DNRS has a unity window and a x10 magnification narrow field of view for the day sight.

Specifications

Crew: 3

Configuration: 8 x 8

Weight: (combat) 13,864 kg
(reduced) 13,182 kg

Power-to-weight ratio: 19.83 hp/t

Length: (gun forward) 7.835 m
(hull) 6.553 m

Width: (over hull) 2.489 m
(over wheels) 2.458 m

Height: (overall) 2.625 m
(turret roof) 2.501 m
(hull top) 1.893 m

Angle of approach/departure: 30/40°

Max road speed: 100 km/h

Max water speed: 9.656 km/h

Max range: 668 km

Gradient: 60%

Side slope: 30%

Vertical obstacle: 0.5 m

Trench: 2.057 m

Engine: Detroit Diesel 6V-53T, 6-cylinder diesel developing 275 hp at 2,800 rpm

Transmission: Allison Transmission MT-653 DR automatic, 5 forward and 1 reverse gears

Transfer case: Rockwell AG-VST (modified)

Steering: power-assisted on front 2 axles

Suspension:

(front four wheels) independent coil springs and shock-absorbers

(rear four wheels) independent torsion bars and shock-absorbers

Brakes:

(main) 8-wheel dual air hydraulic drum brake

(parking) transmission brake and transfer case lock

Tires: 11.00 x 16 with Hutchinson run-flat inserts

Armament:

(main) 1 x 105 mm **M35** rifled gun

(coaxial) 1 x 7.62 mm **M240** MG

(anti-aircraft) 1 x 7.62 mm **M240** MG (or 1 x 12.7 mm)

Smoke grenade launchers: 2 x 4

Ammunition:

(105 mm) 8 ready-use

(7.62 mm) 400 rounds (turret)

Gun control equipment: electric/manual

Gun elevation/depression: +15 to -8°

Traverse: 360°

Stabilizer:

(vertical) yes

(horizontal) yes

Rangefinder: yes (laser)

NBC system: yes

Night vision equipment: yes

Status

Development complete. Ready for production. No funded US Marine Corps requirement. Still being marketed by Textron Marine and Land Systems.

Manufacturer

Textron Marine & Land Systems.

DELCO DEFENSE/RO DEFENCE 120 MM ARMoured MORTAR SYSTEM (AMS)

Development

The 120mm Armoured Mortar System (AMS) comprises a 120 mm smoothbore, breech loading, recoiling mortar integrated with a full solution fire-control system and mounted in a lightweight steel turret that can be fitted to a wide variety of light armoured vehicle chassis.

The now BAE Systems, RO Defence first developed the 120mm breech-loading mortar as a private venture in 1985. The first prototype of the mortar, complete with its elevating mass, was completed and test fired in mid-1986. During 1987, the turret system was integrated onto a United Defense M113A2 chassis and test fired.

In the autumn of 1991, the now General Motors Defense, Light Armoured Vehicle (LAV) 8 x 8 was fitted with the system and successfully completed initial trials at a UK weapons range. During these trials approximately 150 rounds of 120mm mortar bomb were fired at high and low angles in the indirect fire mode as well as in the direct fire mode. For the trials the turret was also fitted with elevation and traverse drives and a mockup of a fire-control system.

BAE Systems, RO Defence is responsible for the turret and 120mm ordnance, Delco Defense of the USA is responsible for the electronics and sighting system, and General Motors Defense is responsible for the LAV 8 x 8 chassis and turret integration.

During 1992, General Motors/BAE Systems, RO Defence undertook the design and construction of a complete turret system with integrated fire control that they then demonstrated. The system comprised a new all-welded steel turret, the 120mm ordnance, and a complete fire-control/sighting system integrated on an 8 x 8 LAV chassis.

In late 1995, another 120mm AMS turret was produced and then fitted to the private venture United Defense LP Mobile Tactical Vehicle Light chassis, a further development of the widely deployed M113 series. This system was then subjected to extensive trials and a customer demonstration in a country in the Middle East.

Early in 1996, the now Delco Defense awarded the now BAE Systems, RO Defence a contract worth £37 million for the supply of 73 120mm AMS and associated ammunition.

Under the terms of the contract, BAE Systems, RO Defence supplied the turret, including the 120mm mortar, Delco Defense supplied the computerized fire-control system and sights.

The complete turret is then fitted to the General Motors Defense, Light Armoured Vehicle (LAV) 8 x 8 chassis.

The BAE Systems, RO Defence order included a substantial quantity of 120mm ammunition, which has been developed by MECAR of Belgium and includes high-explosive (Composition B), illuminating, and smoke (white phosphorus) natures.

The AMS has also successfully carried out a series of firing trials at a UK range with the Swiss Ruag Munitions 120mm mortar cargo round, which is designated the 120mm Ka G 98 in Swiss Army service.

The Swiss 120mm mortar cargo bomb is already in quantity production for the Swiss Army and contains 32 grenades, each of which has a High Explosive Anti-Tank (HEAT) warhead that will penetrate 70 mm of steel armour. It also has a good fragmentation effect. A key feature of this grenade is that it has a mechanical impact fuze with a self-destruct mode and self-neutralization.

Under a Foreign Military Sales (FMS) agreement, General Motors Defense is supplying a total of 1,117 LAVs in 10 versions to the Saudi Arabian National Guard (SANG) with well over 900 vehicles already delivered. The 73 120mm AMS variants are within this figure of 1,117 vehicles.

The 120mm Armoured Mortar System can, however, be fitted on a wide range of other chassis both wheeled and tracked.

Rheinmetall Landsysteme of Germany has proposed that the 120mm AMS could be installed on the R 495 full-tracked chassis. This would have a combat weight of 23,800 kg and carry 100 rounds of 120mm ammunition.

Description

The 120 mm mortar has a semi-automatic conical screw, swinging breech mechanism with obturation being achieved with a Crossley pad. Firing is percussion mechanical activated by a solenoid. The recoil mechanism consists of two buffers and a pneumatic recuperator.

Sustained rate of fire is 4 rds/min; rapid rate is 8 rds/min (sustained for 3 minutes maximum). The ability to fire in direct mode at targets in excess of 1,000m provides the ground force commander with enhanced operational capabilities while also improving the speed of response to conventional indirect fire roles.

The mortar can fire all standard 120mm conventional smoothbore ammunition including the new generation smart bombs currently under development. With the 120mm high-performance mortar ammunition, ranges in excess of 9,000m have been achieved. Also, as the weapon can be fired in the indirect mode of fire at much lower angles of elevation than a conventional mortar, it is much more difficult to detect with mortar locating radar.

The turret is fabricated from armour steel and has stations for two crew members. The commander is to the right and the loader to the left. Each crewman has a hatch for access and egress, and an array of vision periscopes. Mounted either side of the turret is a bank of four electrically operated smoke grenade launchers, which fire over the frontal arc, and mounted on the turret roof is a 7.62 mm machine gun for the commander.

The complete system is all-weather capable and can revert to manual back-ups should a power failure occur. The turret traverse and elevation drives are hydraulically operated.

The full solution fire-control system employs a differential Global Positioning System (GPS) aided Turret Attitude Sensor System (TASS). The latter continuously and automatically updates location, turret bearing and tilt, and cant parameters to the fire-control system. This allows the AMS quickly to engage the enemy with into action times of under a minute being possible. With the information and target location data stored in the computer, re-engagement of any target from any location within range limitations requires only the selection of that target from the computer menu. A number of targets can be entered into the system to allow rapid switching between them.

For the direct fire role, a thermal sight assembly with integral laser range-finder is fitted.

Specifications

Turret

Crew: 2 (commander and loader)

Length:

(without barrel) 2.59 m

(with barrel) 4.46 m

(barrel) 3 m

Width: 2 m

Height: 0.7 m

Armament:

(main) 1 x 120 mm BAE Systems, RO Defence smoothbore breech-loading mortar

(secondary) 1 x 7.62 mm MG

(smoke grenade dischargers) 2 x 4

Control:

(traverse) 360° electrohydraulic with manual back-up

(elevation) -5 to +80° electrohydraulic with manual back-up

Fire-control system:

multitarget input capability with automatic weapon positioning, gun angle calculations and weapon compensation for vehicle attitude and meteorological conditions

Navigation: integrated GPS system for vehicle position, heading and attitude

Optics:

integrated all-weather day/night system with thermal imager and integrated laser range-finder for automatic range FCS input

Weight: (typical) 2,630 kg

Status

Production as required. A total of 73 systems are being supplied to the Saudi Arabian National Guard on LAV 8 x 8 chassis and Australia has a requirement for 20 systems on a LAV 8 x 8 chassis.

This programme is called the 120 mm Light Armoured Mortar System (LAMS). It is expected that 20 LAMS will be purchased to enter service in 2006 under Project Land 135. The 120 mm AMS is one of the contenders for the market.

Manufacturers

General Motors Defense (LAV).

Delco Defense (turret integration).

BAE Systems, RO Defence (turret and mortar).

United Defense LP (MTVL chassis).

GENERAL DYNAMICS ARMAMENT SYSTEMS LIGHT ARMORED VEHICLE (LAV) AIR DEFENSE

Development

In May 1987, the then US Army Tank Automotive Command (TACOM) solicited bids from 75 companies for an air defence version of the Light Armored Vehicle (LAV), but only two bids were received—one from the then FMC Corporation (today United Defense) and the other from the General Electric Company (General Dynamics Armament Systems).

In December 1987, the FMC Corporation (now United Defense LP) was awarded an initial contract worth US\$8.916 million while General Dynamics Armament Systems was awarded a contract worth US\$6.718 million.

Each company built two prototypes based on the Light Armored Vehicle (8 x 8) chassis, which was provided by the Marine Corps, and these commenced trials in August 1990.

The main role of the LAV-AD (air defence) is to engage fixed-wing aircraft and helicopters, with a secondary role to engage ground targets using its 25mm cannon. Typically the Raytheon Systems Company Stingers would be used to engage targets out to 6,000m with the cannon engaging targets out to 2,000/2,500m.

Although the prototype systems had a single pod of four unguided Stinger SAMs and a pod of seven Hydra 70 rockets, production systems have two pods each of four Raytheon Systems Company Stingers with the Hydra 70 rocket pod being optional.

Following trials with the four prototype vehicles in June 1992, the US Marine Corps selected the General Dynamics Armament Systems LAV-AD to meet its future requirements.

The US Marine Corps has already received 758 LAVs in six configurations from the Diesel Division, General Motors of Canada with final deliveries made in 1988. Today this company is General Motors Defense.

The LAV-AD is fully air-portable, being slung under the Sikorsky CH-53E heavy-lift helicopter, and, like other members of the LAV family, is fully amphibious as it is driven in the water by two propellers mounted at the rear of the hull. It is also air-transportable in a Lockheed Martin C-130 and other large-size transport aircraft.

In January 1996, General Dynamics Armament Systems was awarded a contract by the US Marine Corps worth US\$74 million for the manufacture of 17 LAV-ADs.

Under the terms of this contract, General Dynamics Armament Systems provided overall system engineering and management plus assembly and test functions, with major subcontractors being Diesel Division, General Motors of Canada for the 8 x 8 LAV chassis, Raytheon Systems Company, Sensors & Electronic Systems for the sighting system, and the then General Dynamics Defense Systems for the all-electric turret drive system.

In addition to being installed on the LAV (8 x 8) chassis, the Blazer turret can be installed on a wide range of other chassis, tracked and wheeled, for example, the Alvis Stormer, United Defense M113, United Defense Bradley, and MOWAG Piranha (8 x 8).

The first production LAV-AD was handed over to the US Marine Corps in September 1997 and the last of 17 vehicles was delivered in August 1998.

This is the first time that the US Marine Corps has had an organic air defence system as part of the ground combat system.

The initial operational capability of the LAV-AD was achieved by the US Marine Corps on 1 October 1998, when the first section of four vehicles became combat ready. The full platoon has a total of 16 LAV-AD systems.

This will fall under the command of the 4th Light Armored Reconnaissance (LAR) Battalion but will be operated by 83 active duty Marines based at Camp Pendleton and will be capable of world wide deployment. The platoon has four sections each with four LAV-ADs and one LAV-L for logistic support.

Description

The General Dynamics Armament Systems LAV-AD is based on a modified LAV (8 x 8) chassis in which the driver is seated at the front left with the engine compartment to the right and the remainder of the hull free for the turret and ammunition stowage. The commander and gunner can enter the vehicle through the turret and via the twin doors at the rear of the hull.

The turret installed on the LAV-AD is armed with the GAU-12/U 25mm Gatling Gun and eight Raytheon Systems Company Stinger SAMs. The 25mm GAU-12/U is already used by the Marine Corps AV-8B ground attack aircraft.

In addition to the eight missiles in the ready to launch position, each version carries a further eight missiles in reserve, which are loaded manually. A standard Raytheon Systems Company Stinger grip-stock is also carried so that missiles can be deployed away from the vehicle if required by the tactical situation. Each version also has a 7.62mm machine gun for local protection and two banks of four electrically operated grenade dischargers.

According to General Dynamics Armament Systems, the LAV-AD can carry out 44 on-board air-defence engagements. The sensor suite fitted to the LAV-AD includes a forward-looking infra-red (FLIR), daylight TV, eye-safe laser rangefinder and automatic tracking and fire control.

Turret controls are all-electric with manual controls provided for emergency use. A stabilization system is fitted as standard, which allows the system to engage targets while on the move.

Either the commander or gunner can control the turret and lay the weapons, with the turret drives being derived from those used on the United Defense M2/M3 Bradley used in large numbers by the US Army.

Communications equipment fitted includes an AN/VRC 92A dual VHF radio and an AN/GRC(V) 231 HF radio. An AN/PSN-11 precision lightweight GPS receiver is also fitted.

Variants

Further development of this turret for the export market by Thales Defence Systems of France and General Dynamics Armament Systems of the USA has resulted in another version armed with MBDA Mistral SAMs and the Thales Defence Systems TRS 2630 radar system. Details of this system, called Blazer, which commenced firing trials in 1994, are given in this section under International. Development of Blazer has been completed but as of late 2000 no production orders for this system had been placed.

As a private venture, General Dynamics Armament Systems also developed, to the prototype stage, the Blazer Heavy air defence turret. This is no longer being marketed and details were given in *Jane's Land-Based Air Defence 1996-97*.

Specifications

Weight:

(combat (complete system)) 13,319 kg
(turret) 2,676 kg

Crew:

(turret) 2

Armament: 1 x 25 mm GAU-12/U Gatling Gun with cyclic rate of fire of 1,800rds/min, 8 x Stinger SAMs (ready use)

Ammunition: 990 x 25mm (of which 385 are ready to fire); 16 x Stinger SAMs

Turret traverse: 360°

Weapon elevation/depression: +60°/-8°

Turret acceleration:

(azimuth and elevation) 2 rad/s²

Turret velocity:

(azimuth and elevation) 1 rad/s

Sight: FLIR, TV and eye-safe laser rangefinder

Digital fire-control: full solution, fire-on-the-move

Sensors: temperature, pressure, wind and vehicle tilt

Tracking radar: no

Surveillance radar: no

NBC system: yes

Night vision equipment: yes

The Corporals' Report: Vehicle List

Within all these units we have a large mix of other vehicles as follows.

	Vehicle	Pro's	Con's	Remarks
A	ILTIS	Four wheel drive Light Can mount limited weapon platforms	Restrictive to height of personnel Under-powered engine Gasoline fueled Small tires Not designed for North American environments	Should be replaced with the "GM Brute" as a multipurpose vehicle
B	LSVW (wide varieties)	Four wheel drive Good clearance	Under powered Small fuel tank Bad brake design High fuel consumption Not designed for North American environments	Should be replaced with the "GM Brute" as a multipurpose vehicle
C	MLVW (wide varieties)	Six wheel drive Rugged Good fuel economy	Old Better heating system needed	Should be removed from service and replaced with newer HLVW
D	HLVW (wide varieties)	Six wheel drive Good fuel economy Wide varieties available	European design Not produced anymore	Should be replaced with newer version of HLVW built in the USA/Canada
E	BISON	Eight wheel drive Employs a rear ramp Parts easily available Tires interchangeable with AVGP and Coyote		Should remain in service
F	COUGAR	Six wheel drive Parts easy to obtain 76 mm main gun	Main gun can only fire forward Under-powered main gun Poor suspension	Should remain in serviced with upgrades
G	GRIZZLY	Six wheel drive Some parts interchangeable with Cougar and Bison/ Coyote Fast	Under-gunned turret No NBC Poor crew commander placement Poor suspension	Should remain in service with upgrades
H	LAV III	Eight wheel drive Good main gun and fire control systems Employs ramp Well armoured (for APC) Has NBC system in place	Too big	Should remain in service
I	COYOTE	Eight wheel drive Some parts interchangeable with AVGP Good main gun and fire control Good surveillance system	First generation Canadian LAV	Should remain in service with upgrades

	Vehicle	Pro's	Con's	Remarks
J	LEOPARD 1	Good flexibility Good fire control system	Old 105 mm main gun* Hard to air lift	Should be removed from service and replaced with LAV III 105
K	M113 TUA/TOW	Well armoured turret	Under powered Limited range of missile Poor armor protection Tracked/slow	Should be removed from service and replaced with LAV III with Hellfire II turret system
L	M113 ADATS	Good missile system	Under powered Tracked/slower Hard to air lift Poor armour protection	Should be removed from service and replaced with LAV III - AD
M	M109	Good Cannon	Slow Hard to air lift Older system	Should be removed from service and replaced with LAV III 120 mm mortar
N	TOWED 105 MM HOWITZERS	Good gun Light Easy to air lift	Towed No crew protection	Should be removed from service and replaced with LAV III 120mm mortar
O	GRIFFON	Newest helicopter in CF	Civilian aircraft Limited lift capability Limited range	Should remain in service. Redefine role and upgrade to a weapons platform?

Within all these units, we also have a mix of ground weapons systems.

	Weapon	Pro's	Con's	Remarks
A	81 MM MORTAR (not the Dragon LAV)	Good mortar Limited man portable High rate of fire Good range	Ground mounted Crew exposed	Should be removed from service and replaced with LAV III 120 mm mortar
B	ERYX	Good tank killing missile Man portable	Short range Wire guided	Should be removed from service and replaced with the US made Javelin fire and forget missile system
C	84 MM CARL GUSTAV	Man portable Fire and forget	Heavy Poor ammunition	Should be replace the with the composite/lighter system Ammo should be upgraded
D	JAVELIN	Man portable Fire and forget	Crew exposed	Should be removed from service and replaced with the Stinger SAM
E	60 MM MORTAR	Man portable Good mortar High rate of fire Good range with base plate and bipod		Should remain in service. Its use within the infantry company should be redefined

BOOK REVIEWS

Certainly Not the Flavour of the Week...

The Sources of Military Change: Culture, Politics, Technology by Theo Farrell and Terry Terriff, eds. Boulder, Co, Lynne Rienner Publishers, 2002. 301 pages. US \$55.00

Reviewed by Colonel Mike Capstick, CD

As the title implies, the editors of *The Sources of Military Change* have attempted to develop a model of military change that encompasses the broad areas of culture, politics and technology. Although no small task, the result is worth the effort and is an important contribution to the growing body of literature on military change and transformation. More importantly, the first chapter and the conclusion (both written by the editors) add a great deal to our theoretical understanding of the most important drivers of military change. In light of the current debate within the Canadian defence community about the real nature and scope of the Revolution in Military Affairs as well as the growing consensus that the status quo is no longer acceptable (see the SCNDVA Report of 30 May 2002), there can be little doubt that the Canadian Forces will see major change in the next few decades. Because these changes could well transform the fundamental understanding of defence and security in this country, *The Sources of Military Change* should be required reading for defence planners and analysts, academics, public servants at the policy level, and senior military leaders.

The editors are both academics working in European universities, and the authors of the individual chapters represent an excellent cross-section of nationalities and academic disciplines, as well as one renowned practitioner of military reform—Admiral William Owens, the charismatic American naval advocate of “net-centric warfare.” Unlike the usual collections of academic conference papers, Farrell and Terriff have produced a well-disciplined anthology that provides historical,

political, sociological, and cultural perspectives using a common analytical framework.

Part One of the book includes the introduction, written by the editors, which sets the scene with a well-written and coherent explanation of the common analytical framework that the remaining chapters follow. This framework is based on the idea that military change can only be understood and managed when culture, politics, and technology are considered together. In other words, no single factor can, on its own, produce a military transformation. In establishing this analytical theory, the editors describe the complex relationship between national strategic culture, the institutional culture of the military, politics and strategy, and technology. They highlight the critical role that emulation of the dominant military plays in shaping decision making, and they conclude that technology alone does not determine the trajectory of military transformation. The other contribution to this section is a chapter by the eminent British military historian Jeremy Black (the author of the excellent *War: Past, Present and Future*), which attempts to provide a broad historical description of the dynamics of military change. Unfortunately, this chapter is too broad in its scope to be fully effective. The remaining chapters of the book provide the evidence for the editors’ method of analysis by way of a number of case studies. As space precludes a detailed review of each chapter, only those of the most value to the Canadian reader will be discussed here.

Part Two of *The Sources of Military Change* examines the cultural aspects of military change using historical case

studies. Of the three studies in this section, Terriff’s “US ideas and Military Change in NATO, 1988–1994” is the most pertinent to Canadian strategic thinking. In this study, he traces the evolution of the Combined Joint Task Force (CJTF) concept and describes both the strategic imperatives and the institutional dynamics that led the Alliance to adopt the CJTF as its primary method of organizing for combat. This piece is both highly detailed and well researched. It employs the analytical tools of international relations theory as well as a sophisticated perspective drawn from institutional sociology to demonstrate the complex and diverse factors that influence military change. He concludes that sociological factors, principally emulation of the American military, were at least as important as NATO’s strategic direction in driving the post-Cold War shape of the Alliance’s military structure. Terriff also argues that smaller militaries with severe resource constraints are likely to adapt the CJTF concept and to develop specialized capabilities as a means of achieving internal and external legitimacy. In other words, sociological rather than strategic reasons could well become the primary factor in military change. This is clearly a possibility in the Canadian context, and it would be a worthwhile exercise to examine *Defence Strategy 2020* using the theoretical framework and method described in this chapter.

Although less germane to modern Canadian defence concerns, Farrell’s chapter on the development of the Irish Army between 1922 and 1942 also emphasizes the importance of emulation as a determinant of military

change. Although most Canadian officers and academics would have little interest in the Irish Army during this period, Farrell's description of the influence of the British model is very similar to the Canadian experience, and his descriptions of Irish plans to counter a potential British invasion conjure up images of inter-war Canadian defence plans against the American "threat."

Part Two also examines the strategic and political determinants of military change with an emphasis on the American and Russian armies. Although none of the chapters breaks any really new ground, they do serve to encapsulate the political component of change. In the two articles on the US Army—Cameron, "The US Military's 'Two-Front War,' 1963–1968" and Avant and Lebovic, "US Military Responses to Post-Cold War Missions"—the adaptability and responsiveness of the American military is highlighted. In contrast, Jennifer Mathers' "Reform and the Russian Army" provides a compelling description of an army that seems terminally incapable of reform. Although all three articles are very specific in terms of time and place, they are nonetheless instructive in terms of the complex relationship between culture, strategy and politics.

Part Three is concerned with technology. The most substantive chapter in this section is Chris Demchak's "Complexity and Theory of Networked Militaries." Despite it not being the easiest read, this article does provide a balanced view of the role of technology in general, and information technology in particular, as a factor in military change. Demchak bases his work on the complex systems theory and builds a strong case for careful technological adaptation in the military sphere. He argues convincingly that surprise is an inherent characteristic of complex systems and that the risk of uncontrollable and "rogue" outcomes is very real. Demchak also develops a compelling critique of the assumption of information supremacy and fidelity that underlies the American *Joint Vision 2010* and, by extension, our own *Defence Strategy 2020*. In the end, he cautions against the claims of the most ardent

and vocal RMA proponents and advocates a "midrange theory of networked militaries" that is shaped by cultural, political and strategic realities.

Demchak's chapter is also an excellent counter-point to Admiral Owen's disappointing recapitulation of American transformation efforts. Owen, instead of appreciating the realities of institutional culture and politics, seems content to blame the sporadic record of RMA adaptation on everyone else's parochialism. He also ignores the real limits of technological growth, cost factors and the risks involved in going to war against low-tech enemies using a "system of systems" based solely on high tech information systems. Despite the claims of some of the more enthusiastic RMA advocates and the clear technological superiority of the American military, recent operations in Afghanistan illustrate the real limits of information dominance and long-range precision strikes. Although these concepts shaped the battle and had notable success in the early days of the campaign, the adversary responded by shutting down its more vulnerable communications systems, retreating into the mountains and abandoning infrastructure that remained vulnerable to precision weapons. They, in effect, created uncertainty and developed a strategic stand-off, by reverting to pre-modern tactics. Owen's article fails to deal with these issues and, as a result, fails to provide a convincing model of military change.

Part Three also contains a historical case study that is one of the most original contributions to the book. John Stone, a professor of War Studies at King's College, London, provides an alternative narrative to the conventional critique of the British Army's failure to maintain their superiority in tank warfare at the end of the First World War. This period, a staple in the study of military history, is usually characterized by criticisms of British military conservatism, a lack of doctrine, unimaginative leadership and the "culture of the horse." Stone argues that the real problem was that, in this period, the tank itself was the main reason that the British Army did not

fully embrace and adapt to mobile armoured warfare. He makes the case that the people and the ideas were ready, but that the technology itself was not. He argues that the range, speed, communications, firepower and reliability of the tank were simply not well enough developed to trust the defence of the nation to it. This article will interest many Canadian officers from a historical perspective. It should also serve as a cautionary tale to those who automatically attribute problems in integrating new technology to inherent military conservatism and parochialism. Stone's point is that the dynamic is far more complex than our conventional view—an important lesson for those who view technology as a "silver bullet."

The Sources of Military Change is one of the most important contributions to our understanding of this issue in recent years. Too often military change seems driven by the latest trend or "flavour of the week." Farrell and Terriff have succeeded in developing a solid theoretical construct that has the potential to be very useful to those charged with the management of change. The contributors, for the most part, support the theory with well-researched and thoughtful analysis. That said, this is not a book for everyone. The writing is very academic in places, and there is a presumption that the reader has a level of expertise in military history and theory. This book would be a valuable addition to the library of any staff college. It should also be considered essential reading for officers and public servants involved in today's CF "change agenda," and it would be a valuable addition to the reading list of any number of academic courses concerned with the history and dynamics of military change.



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On the Importance of Doctrine...

Quest for Decisive Victory: From Stalemate to Blitzkrieg in Europe, 1899 - 1940. by Robert M. Citino, Lawrence Kansas, University Press of Kansas, 2002.

Reviewed by Lieutenant-Colonel (ret'd) C.S. Oliviero, CD

Students of military history are often to be pitied. They spend innumerable hours poring over dry military texts and even drier histories written by academics who shudder at the thought of producing an interesting sentence. Occasionally, an historian of note appears who can not only base his works upon solid research, but who can also write prose which brings the *Fakten und Daten* ("facts and dates") of that research to life. Such an historian is Professor Robert Citino of Eastern Michigan University, and his latest work *Quest for Decisive Victory* is a pleasure to read. It is written in crisp and interesting sentences, which flow from the author's pen (or word processor) like the latest Tom Clancy novel.

In slightly over 280 pages, with an additional hundred or so pages of notes, Citino explains the loss and recovery of operational manoeuvre and decisiveness during the last decade of the nineteenth century and the first half of the twentieth. The book takes a detailed, operational-level look at military conflicts and also discusses the military debates over doctrine during the period by European armies in their *Quest for Decisive Victory*.

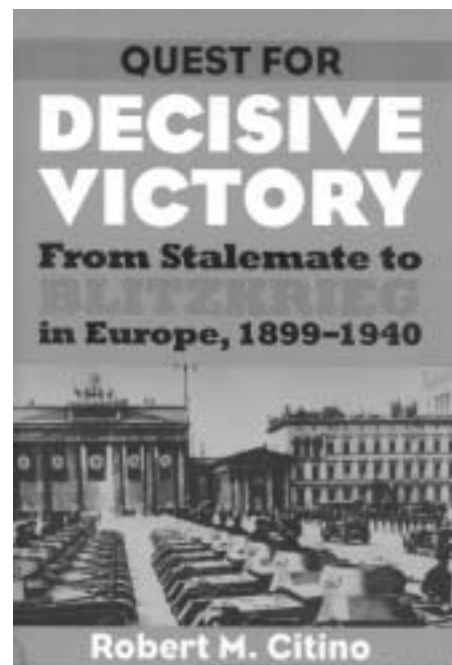
Citino breaks his book into eight chapters, which could be read easily as discreet of essays. They cover both the broad and the specific. Citino begins with the breakdown of the legacy of Napoleonic warfare and then moves successively through the Boer War, the Russo-Japanese War, the Balkan Wars and the First World War. He then discusses the doctrine and innovation of the interwar years and highlights the "experimental doctrinal laboratories" of Ethiopia and Spain. He concludes with the rebirth of Operational Art during the first couple of years of the Second World War. Each chapter contains an extensive narrative describing the major engagements with

a particular focus on the command and control as well as the technology introduced to warfare during the conflict. He then summarises, sometimes better than others, the lessons of that particular war.

Citino begins with a useful and refreshing debunking of the myth of nineteenth century incompetence in warfare. He correctly points out that although there were terrible blunders, some of them breathtaking in their bloodletting, not all nineteenth century warfare was rife with stupidity, shiny boots and large moustaches. The problem lay with who set the standard, namely Napoleon. Professor Citino lays out perhaps the best six-page description (pages 3-8) of the genius of Napoleon's success that this author has yet read. He then goes on to describe the emperor's interpreters (Jomini and Clausewitz) and then moves to historical examples.

The value of Citino's latest book once again lies in his dispelling a particular myth. That is the myth that all warfare from Waterloo to Mons was lacking in any great tactics, operations or leadership. Just as he did for the myth of German innovation towards battlefield success in *The Path to Blitzkrieg - Doctrine and Training in the German Army, 1920-1939*,—where he argues convincingly that German battlefield success was not the result of any particular new tactical method, technology or weapon but of institutional excellence that came about through sustained effort for a period of decades—so, likewise, Citino argues successfully here that the rediscovery of operational pursuit was a long and difficult process brought on through decades of study.

Like his previous book, Citino's *Path to Blitzkrieg, Quest for Decisive Victory* fills a gap in the historical record. Numerous books have



questioned how those same idiotic officers who fought the First World War with such incompetence could win the Second. The conclusion of the great majority of books is the same: the lessons were learned and the same mistakes were not made a second time. Citino gives us a better explanation complete with historical provenance.

Lest I be accused of being too fond of this work, let me say that it does have its limitations. Firstly, it is almost entirely focused on European armies, whether they fought on the continent or elsewhere. The American Civil War, often called the first modern war, is left almost unmentioned. Citino tell us this at the onset. Nonetheless, this is a pity for European professionals did pay attention to what the North and South were doing, despite their haughty insistence that this was a bloodletting carried on by amateurs. Secondly, there are long stretches of narrative in the book, which although well written and interestingly full of detail, add little to the thesis of the work. The details of some of the battles are fleshed out in

slightly more detail than one needs if the true reason of the book is to explain why and how European armies re-discovered the art of the operational pursuit. The real meat of each chapter is contained in the conclusions, which are very pithy but do not require the extensive narrative that precedes them. The reader almost gets the feeling that Citino's editor had admonished him for not making the book long enough and that the author was obliged to go back and "thicken it up." Lastly, there is no final set of conclusions. The book ends almost abruptly with the opening battles of the Second World War. One is left with a feeling of missing something. It is akin to being served an excellent meal but being told that there is no coffee or dessert. It is unfortunate, but these are minor criticisms.

Every book contains a kernel. Around this kernel the author builds layers of fact. If the author is skilled, as is Professor Citino, then the layers of fact are interwoven with the fibre of analysis, argument and conclusion. The kernel of this book is that most historians and military thinkers missed the mark when analysing why warfare changed with the introduction of the rifle (as it replaced the musket). Most became absorbed with the rapid-fire accuracy of the rifle, with the predictions of the end of the assault,

and with the strength of the defence. The First World War seems to bring all of this to the fore in great blood red detail. But Citino correctly states that the real question of what changed when the rifle appeared on the battlefield was the issue of *command and control*—both of the firepower at your disposal and of the men who were under the lethal gaze of the enemy's firepower. If you dispersed to save lives, then you could not control; if you concentrated to fire (as in trenches), then you became a target for the enemy. This book is really about how armies first failed to understand this dilemma, then came to see the problem correctly, then solved the problem in order to once again achieve truly "Napoleonic" victories such as the German victory over France in 1940.

In closing I must say that as I read this book, I was haunted by what I had heard so many times on battlefield studies in the *bocage* of Normandy and rolling hills of Italy: in both cases the Staff College students would always wonder aloud at why the Canadians, who had so valiantly won hard fought tactical encounters with a more battle-hardened foe, whether at Pachino or at Caen, never exploited their successes. Students invariably questioned the Canadian proclivity to force a tactical pause. Canadian commanders inevitably

stopped and allowed the Germans to recoup, regroup and reposition for another fight. By contrast, Oberst Muhm, who successfully delayed a battalion of Van Doos at San Fortunato Ridge outside Rimini and who won his Iron Cross after launching his seventh counterattack in the course of a long day's fight, was invariably gracious: the Canadians were every bit as determined, brave and audacious as his beloved *Grenadier*. German veterans routinely heaped angry praise on the Canadians' ability to fight but were thankfully appreciative of their inability to exploit success. The real answer to the students' questions is deceptively simple. As Citino rightly points out in his books, the answer lies in doctrine. Canadian doctrine underplayed the value of pursuit (or exploitation) just as most European armies had undervalued it. The "quest for decisive victory" was lacking in Canadian doctrine. I cannot help but wonder: is it still?



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Derelection of Duty: Lyndon Johnson, Robert McNamara, the Joint Chiefs of Staff and the Lies that Led to Vietnam

by H.R. McMaster, New York, Harper Collins College, 1997, 464 pages.

Reviewed by Major (ret'd) Howard Coombs, CD

HR. McMaster, in *Derelection Of Duty: Lyndon Johnson, Robert McNamara, the Joint Chiefs of Staff and the Lies that Led to Vietnam*, documents many examples of the systemic failures of the planning systems utilized during the prosecution of the Vietnam War. However, two deficiencies seem to be more profound than the others.

Firstly, the qualitative failure of President Lyndon Johnson to formulate national objectives vis-à-vis the conflict led to a disjointed, inadequate use of the military instrument of power in Vietnam. Secondly, the procedural blunder of the President and Secretary of Defense Robert McNamara in their refusal to consult and heed their experts, the Joint Chiefs of Staff and others in an

atmosphere free from coercion and hidden agendas further exacerbated the poor military strategy being implemented in the theatre of war. These errors contributed greatly to the lack of success experienced by the United States in Vietnam.

McMaster argues that President Johnson did not base his directions to

his government and the military on a set of clearly articulated national objectives, which could have been translated into subordinate objectives for all the instruments of power—diplomatic, informational, military, and economic. Instead the President's actions were based on domestic political considerations and oriented towards what he believed was an acceptable policy—a free and democratic Vietnam. Due to this desire to maintain a politic digestible to all, the Johnson administration did not promulgate clear strategic objectives, and those unclear strategic objectives prevented the formulation of a logical plan, or ways, for the conduct of the campaign in Vietnam. The military strategy became based on means rather than ends. That is, the Joint Chiefs did not make recommendations based on mutually agreed upon objectives; rather, their recommendations were predicated on the forces the President was prepared to make available based on the potential impact on his domestic political agenda. With this orientation the focus of the Joint Chiefs digressed to the tactical level, measurable increments of body count and ground secured, with even the massive air campaign Operation ROLLING THUNDER becoming a micro-managed exercise in destroying limited tactical objectives without any link to a strategic end state. As forces, or means, were gradually increased and fed into the maw of the slowly widening conflict without clear strategic aims, or ends, and with a corresponding lack of a campaign plan, or ways, the United States became inextricably moribund in Vietnam.

In my opinion, after reading *Dereliction of Duty*, another critical omission of the Johnson administration was the failure to create a “command climate,” in which their military experts, the Joint Chiefs of Staff, could freely proffer advice on the United States’ military involvement in Vietnam. President Johnson claimed to subscribe to the concept of the team, with himself occupying the position of coach, but his advisors understood that if one did not provide the “coach” with the advice wanted to hear, one became

marginalized. This was illustrated in February 1965, when Vice President Humphrey recommended the United States withdraw from Vietnam because he believed that continued involvement, within the policy of “graduated pressure,” would eventually create a large degree of opposition to the current administration. President Johnson responded by excluding his vice president from all consultations regarding Vietnam. Within the context of the relationship between the Joint Chiefs of Staff, the President and the Secretary of Defense, Robert McNamara had adopted a policy of deliberately misleading and misinforming the Joint Chiefs in order to placate them and maintain the illusion that their advice was being heeded. Additionally, they had been excluded from many of the deliberations leading to national military involvement. When military participation in these meetings was solicited, it more often than not came in the form of a complaint from the Chairman of the Joint Chiefs of Staff, General Maxwell Taylor, or his successor, General Earle Wheeler, who did not accurately represent the views of the Joint Chiefs of Staff. This biased representation was never addressed in a cohesive manner by the Joint Chiefs of Staff, primarily due to a lack of unity that stemmed from inter-service rivalry, parochialism, and blind obedience to perceived superior direction.

As a result of these factors, President Johnson received biased opinions, filtered through men like-minded to him who, in turn, proffered disinformation according to his expectations. Both President Johnson and Mr. McNamara created a situation where expert advice was not solicited or was disregarded. Military planning responsibilities were shifted from the Joint Chiefs of Staff to informal groups of close advisors and civil servants supportive of the Johnson administration. In 1965, when this situation became blatantly apparent to the Joint Chiefs of Staff, they acquiesced by assisting President Johnson and Mr. McNamara in deceiving Congress and the American people as to the forces required to win the Vietnam War, thus supporting a strategy which they knew

would lead to an increased deployment of troops but in insufficient numbers to win the Vietnam War.

H.R. McMaster documents very thoroughly the gradual and, in the context of the described events, seemingly inevitable commitment of the United States to a war that was, in retrospect, not winnable. McMaster seems to suggest that the two greatest deficiencies demonstrated by the Johnson administration were the procedural inability to formulate definitive strategic objectives and the qualitative failure of the President's advisors to provide honest, unbiased advice. President Johnson and Secretary of Defense McNamara, as well as a host of civilian and military advisors, staff and politicians deserve their share of the blame for the manner in which their country was implicated in the Vietnam War. However, it is my view that the President, the Secretary of Defense and the Joint Chiefs of Staff should be castigated by history for the manner in which they deceived their nation as to the nature of the American military involvement in Southeast Asia and committed the most precious resource of their country, its sons and daughters, to pay with blood for an ill-conceived and poorly executed national commitment. I heartily recommend *Dereliction Of Duty* as not only illustrative of weaknesses of strategic policy formulation and implementation but of the necessity of the professional soldier to maintain his compact with the nation despite extreme pressure to do otherwise.



Major Howard Coombs has recently transferred from the Regular to Reserve Force and has commenced a Ph.D. programme at Queen's University in Kingston, Ontario.

The Stand-Up Table

Commentary, Opinion and Rebuttal

More on "Starship Troopers – A Polemic, The Army Doctrine and Training Bulletin, Volume 5, No. 2, Summer 2002, page 81.

Captain Andrew B. Godefroy of the Canadian Forces Joint Space Support Team writes...

IN DEFENCE OF THE WELL READ SOLDIER (AND STARSHIP TROOPERS)

Major Farrell's criticism of Mr. Ridler's article on the merits of *Starship Troopers* is demonstrative of a culture that continues to exist in our forces, one that shirks away from reading anything more militarily complicated than their soldier's card and is quick to create just about any excuse to justify why the *Army Reading List (ARL)* should be ignored. Ironically, it is partly due to such attitudes that the *ARL* was created in the first place, but that is a whole other essay. Let us now focus instead on the latest argument for intellectual illiteracy.

Major Farrell's argument against the value of the *ARL* is very weak and must be challenged. Simply put, he seems to have missed the whole point of the publication. First, he criticizes the Chief of the Land Staff for ambiguity in the foreword, arguing that because Lieutenant-General M.K. Jeffery identified the *ARL* as a "starting point" rather than as "exhaustive," the books on the list are therefore suddenly of questionable value. Next, Major Farrell argues that to compile such a "worthy" list is practically impossible anyway due to the sheer quantity of volumes available and the fact that personal biases would derail any attempt at objective assessment. Finally, he suggests that, rather than consult the *ARL*, one should instead turn to "book reviews, bibliographies, or just the recommendations of friends."

Having reread the foreword of the *ARL*, I am at loss to understand Major Farrell's issue with the wording. Nowhere does the *ARL* contradict itself by inferring that it is the be-all and end-all of soldier's reading as he has suggested. The short introduction is not dissimilar from dozens of other

current military reading lists, most of which carry the caveat of simply being a point of departure for expanding one's knowledge base in a particular field. Reading lists are not designed to be exhaustive and, in fact, to do so would go against the very essence of the guide, which I would argue is to encourage a life-long learning approach to the profession of arms.

Next, Major Farrell's argument that the *ARL* is a pointless endeavor since there are so many meritorious works out there (so many, in fact, that Major Farrell fails to mention a single one) and that personal agendas would negatively influence the objectivity of any such list leads me to ask, if such is always the case, how do we determine the value of anything? Could not Major Farrell's hypothesis be just as easily employed against, e.g., the grading of cars? In other words, since there are so many models out there and so many car dealers, how could anyone successfully demonstrate that one car is better than another? Where would the criticism of judgment end? I commend the major on his exhibition of pure, unadulterated faulty logic.

In reality, there is a highly evolved literary review process that assists us in sorting the wheat from the chaff, including everything from editorial and peer-based reviews to general reader forums and public opinion. Though I agree that no one will ever manage to read through every good book ever published on a particular subject, one could easily feel content, using guides such as the *ARL*, that they may successfully read the lion's share of the better ones. Bias also has its merits, and a modest application of subjectivity in the compilation of a reading list is in fact welcoming to us "intelligent people" who appreciate it. I would argue that it does not take much common sense to

determine the qualitative differences between Charles Ardant du Picq's, *Études sur le combat* and Scott Taylor's *Esprit de Corps*, but if educated bias and subjective assessment is considered a fault, then let the *ARL* be damned.

Finally, Major Farrell's last argument is nothing more than pure hypocrisy. He offers that one should abandon the *ARL* and instead turn to "book reviews, bibliographies, or just the recommendations of friends." Is the *ARL* not essentially a peer reviewed, annotated bibliography recommended by a fellow army officer? So what is the problem?

Perhaps that is the problem. Some soldiers have discarded the utility of the *ARL* because they questioned the ability of the CLS and his staff to compile such a list. As one officer commented to me, "why should [so and so] be the one to decide what we need to read anyway?" Such comments are disconcerting; unfortunately, they are not the worst I have overheard. Other comments I have recently overheard about the utility of the *ARL* have included:

- "I don't need to be told what to read."
- "Like I've got time for that."
- "When the Army buys them [for me], I'll read them."
- "I've had enough school – thanks."
- "What's the point? Most of these people are dead."

Perhaps it needs to be stressed that the *ARL* is more than the baseless concoction that Major Farrell suggests it to be and is representing a larger school of literary criticism and thought than just the CLS and his staff (though it is worth defending those who compiled the *ARL* – a well-educated and well-read group). Take, for example, the inclusion of Robert A. Heinlein's *Starship Troopers* (1959). The novel received the prestigious Hugo Award for best science-fiction novel in 1960, an award that is bestowed based on the opinion of the general reading population. It was this accolade among others (Heinlein

was awarded the Hugo three times and the peer voted Grand Master Award once) that helped determine the potential for his work for inclusion in the *ARL*. Far from being “campy literature” (and I wonder whether Major Farrell is referring to the novel or the screen play) *Starship Troopers* generated significant political debate regarding the role of the individual in the state during the height of the Cold War and, as Mr. Ridler pointed out in his own article, was the catalyst for later deconstructions of the same theme during the Vietnam war period and beyond. In essence, most would agree that *Starship Troopers* is a good read and generates intellectually healthy conversation.

Ultimately, if the *ARL* is to truly serve its purpose, the Army’s senior leadership must support it and expand upon it. Although the Army cannot force its members to read, it can certainly

create conditions that would induce its members to take a greater interest in professional military education (PME) and professional development (PD). Even the smallest gestures help. For example, a small portion of my budget is devoted to the subscription to two of the key professional journals in our field. On another occasion, a member complained to me that, though he would like to digest the contents of *The Army Doctrine Training Bulletin*, there was never any time. He felt that the only opportunity would be during off-duty hours, and there were simply too many other commitments such as family demanding his attention. The simple solution was to make PME and PD part of our routine schedule, and to assure the member that he should not feel guilty if he spent a small portion of his day reading *The Army Doctrine and Training Bulletin* or other professional military journals and books. In addition,

I started a small section library that included various military, technical, and historical subjects and was pleased to see that my staff (and, for that matter, other staffs as well) not only regularly took advantage of it, but also started adding their own recommendations. All of these initiatives were based on the same principles of soldiering applied to other activities. Like physical training and marksmanship, accessibility and regularity leads to proficiency, skill, and, above all, sustained interest.

The Army can set the conditions for reading success, and it has done so in part with publications such as *The Army Doctrine and Training Bulletin* and the *Army Reading List*. Essentially, the Army is being led to the water; hopefully, Major Farrell and others will not die of thirst.



The Code of Change

Colonel Steve Appleton, CD, until recently Director, Directorate of Land Force Readiness writes...

The situation the Army finds itself in as we commence 2002 is well known to most. The change agenda underway in the Land Force is part of a transformation process that will continue to create turmoil for many more years. At times, I am sure it appears to the various audiences witnessing this change that the process is too long and overly complicated; in many ways there must be a better and simpler way to “crack the code of change.” This is a leadership responsibility at the highest levels.

In the *Harvard Business Review* dated June 2000, author Michael Beer reported on 40 years of researching corporate change. Two archetypes of change theory exist: Theory O, based on organizational capability, and Theory E, founded on value maximization.

A careful review of each approach exposes some interesting insight into the Army’s present situation. In simple terms, Theory O strategies are centered on building culture, addressing behaviours, attitudes, capabilities and commitments. Lesson learning is a legitimate and well-used benchmark of organizational

success. Leadership adopting Theory O builds and reinforces the organization’s human resources, which is considered the essence of the company and which provides the capacity for sustained performance. Anything less, as the theory purports, hollows out the organization. Alternatively, Theory E pundits follow the strategy of downsizing, rightsizing and organizational restructuring. Organizational value, as determined by stakeholders, is considered the only pertinent measure of success. Top-down directed structure and systems streamlining results in outsourcing, extensive use of consultants

and a distancing of the leadership from the workforce. This approach is the most effective method, according to Theory E strategists, for creating turnaround scenarios and demonstrating value optimization. Table 1 below captures the comparison of these two theories.

Clearly, both approaches have explicit and implicit challenges. In a turbulent operating environment, most organizations adopt a Theory E approach. It produces results, in a tangible sense, more quickly. It also, however, creates strategic sustainability risk. Comparatively, timelines associated with Theory O are longer, and loyalty and commitment to the organization’s human resources can prevent difficult decision making. It is the only approach, however, that focuses on the value of people.

Dimension of Change	Theory E	Theory O
<i>Goals</i>	Maximize stakeholder value	Develop organizational abilities
<i>Leadership</i>	Manage change from the top down	Encourage participation from the bottom up
<i>Focus</i>	Emphasize structure and systems	Build organizational culture
<i>Process</i>	Plan and establish programs	Experiment and evolve
<i>Reward System</i>	Motivate through s financial incentive	Motivate through commitment
<i>Use of Consultants</i>	Consultants analyze problems and shape solutions	Consultants support management in shaping solutions

Table 1 – Theories of Change Comparison

Some of this analysis should look familiar. The Army has adopted the most difficult approach to strategic change (one that very few private companies have attempted, and even fewer have executed successfully): the combination of the two theories. This direction, ultimately the most comprehensive and progressive of the two alternatives, is also the most dangerous. The mixing of Theory E and O techniques can prove destabilizing to the organization if done incorrectly. If management cannot implement the combined approach properly, the result

has proven historically to be the realization of the worst of both theories with the benefits of neither. Synchronizing the two paradoxical approaches is the key.

This is where we are now. The approach the Army has undertaken is one that recognizes the need to restructure to derive both enhanced capability and organizational value. Concurrently, extensive work is underway to address organizational culture and build the Army's greatest resource—people. This requires great willpower, skill and

wisdom. Unfortunately, it also takes time, perhaps measured in decades. The integration of the two theories, however, is the only way the Army will be able to achieve the transformation envisaged. More importantly, it is the only way the Army will achieve organizational success. One must remember, where there is great risk there is also great reward.



Divisional Commander: The Need for a Field Force Champion

Major Malcolm Bruce, of the 2nd Battalion, Princess Patricia's Canadian Light Infantry writes...

I write this as I am sitting in the Kananaskis Valley on operations attempting to provide empirical data to my brigade commander on several options for generating forces for OP PALLADIUM Roto 12. These options include generating a LAV-capable reserve combat arms company, an LPV reserve combat arms company or "twinning" the remaining battalion rifle company to achieve the proposed two LAV coys for the roto. The challenges facing our battalion are not unique. Yes, we have 140 infantry soldiers that are non-deployable due to OP APOLLO (95% of which were given operational waivers from OP PALLADIUM Roto 7). Yes, we are 100 soldiers short of our establishment strength, but in relative terms, all the other infantry battalions are in similar predicaments. What has driven me to put pen to paper is the need to even conduct staff checks on some of these options.

The 2nd Battalion Princess Patricia's Canadian Light Infantry is continuing to work through an incredibly high op tempo period, one that we have not seen previously in our collective memories. Manning shortages, LAV III and TCCCS (Tactical Command, Control and Communications System) implementation, post-Roto 7 deployment issues, EX URBAN RAM, OP APOLLO, EX ROBUST RAM, pre-deployment planning for OP PALLADIUM Roto 12, and the myriad of personnel issues (operational stress injuries, occupational transfers, courses, tasks, etc.) are but a few of the

challenges faced by the commanding officer. The brigade commander knows of and understands these issues. It is above the brigade commander level that I must admit I challenge the assumption that these issues receive their due attention. This is not to say that the area commander or the Chief of the Land Staff are not aware of the challenges—they are. However, they have different foci at the operational and strategic levels, and the impacts at the tactical level do not necessarily receive the same weight. This is not a criticism; it is reality. It is for this reason that the field force (the mechanized brigade groups) needs a champion, someone that has, as his primary responsibility, the operational effectiveness of the field force. We are a three-brigade army. This is not scheduled to change as we move through the Interim Model to the Army of Tomorrow. We will be structured on 100-soldier building blocks, but the Army still remains responsible to provide an expeditionary force of two battalion-size units and one brigade group.

The Chief of the Land Staff has a tremendous span of control, one that obliges him to juggle resources between operations, infrastructure, capital, human resources, training, reserves, and institutional long-term health. These are not small tasks. To assist him he has a number of subordinate commanders: area commanders to support infrastructure, domestic operations, reserves, Quality of Life (QOL) and certain aspects of individual

training; Commander LFDTS to support individual and collective training and intellectual health (doctrine, future focus, experimentation); and the ACLS, who deals with infrastructure and financial issues. Each of these subordinate commanders is competing for resources to execute the Chief of the Land Staff's tasks. Given enough resources and time we could conceivably do everything, but the reality is that there is never enough. Two levels down are the brigade commanders, the leaders at the tactical level. They are responsible to execute direction, generate forces, deploy forces on exercises, and manage the conflicting priorities and tasks. Though the brigade commanders are responsible to the area commanders, I would contend that, in fact, their respective priorities are not necessarily the same: the area commanders' priorities include reserve issues, infrastructure, QOL, and domestic operations, while those of brigade commanders include individual and collective skills, taskings, and force generation. There is a crossover. It is the degree to which this overlap exists that is in question.

The field force needs a divisional commander, one that the brigades are responsible to and trained by. The divisional commander would be an individual whose primary responsibility would be the field force. He would visit and guide training, and, most importantly, keep his finger on the pulse of the field force. Questions such as the need for a LAV reserve company for OP PALLADIUM Roto 12 would never even be raised. The divisional commander would not allow it to be asked of a brigade commander. He would already know the answer. Two or three

years in the life of an army sees many changes. It is only someone who is involved, responsible, and focused on such changes who could truly understand and champion them. The divisional commander would be that champion.

Of course, such a divisional commander would require a supporting divisional headquarters, which is currently lacking. The obvious solution to the current lack of a supporting divisional headquarters would be to re-role the CF Joint Force Headquarters (JFHQ). In reality, the current JFHQ can only perform the role of a national

command element. A divisional headquarters would be multi-dimensional with the capacity to support a divisional commander and would be deployable both domestically and internationally as required with relatively little augmentation. The JFHQ did not deploy on OP GRIZZLY; the area headquarters formed the basis of the JTFHQ, for which it was neither manned nor structured. Harnessing current technologies such as LFC²IS and maximizing simulation capabilities would provide the required interoperability within the divisional framework. Because the battlespace is changing, we must adapt and exploit these new

capabilities. Physical separation will force us to do so.

In closing, a divisional commander would positively impact on a number of areas: such a position would foster a more cohesive command climate for senior Army officers, it would have a singularly focused commander for the field force, who would plan and execute the annual brigade training event, and it would address the chronic lack of command experience for our general officers.



War as Science: Jomini and American Doctrine

Lieutenant Colonel Stephen Saulnier, Commanding Officer of the Canadian Forces Joint Signal Regiment writes...

It is said that many an American Civil War general went to war with a copy of Jomini's *Précis de l'art de guerre* in his pocket.¹ That Jomini's theory that war could be distilled into a series of simple, universally applicable principles and maxims found widespread acceptance in the post-Napoleonic era is understandable, but the continuing adherence of the US Army to his ideas is at once interesting and troubling. While acknowledging that future warfare is likely to be characterized by unpredictability, asymmetric threats, increased lethality, and operational tempo, the US Army's keystone doctrinal manual, *FM 100-5 Operations*, relies on the Jominian constructs of "... time-tested principles and fundamentals"² and decisive victory obtained through the massing of combat power at decisive points to ensure success in operations. This commentary will examine the persistence of Jominian thought in the modern US Army and will argue that this persistence implies that Jomini, rightly or wrongly, will continue to inform future warfare as it will be practised by the Americans.

The major tenets of Jomini's thought provide that all warfare is controlled by invariable scientific principles that prescribe offensive action to mass forces against weaker enemy forces at a decisive point.³ In defining his universally valid principles, however, Jomini tended to ignore the irrational and psychological

factors of war because of their incalculability.⁴ *FM 100-5*, for its part, contends that its nine principles of war and five tenets of operations are fundamental to operating successfully and essential to victory.⁵ Psychological aspects of war—including will, morale and deception—are mentioned in *FM 100-5*, but they are conspicuously absent from the list of essential principles. As regards the massing of forces, *Operations* introduces the subtlety of massing combat effects as opposed to the physical massing of forces,⁶ but the ultimate aim of concentrating these effects against the enemy at a decisive point remains. In fact, the modern concept of an agile force that exploits superior mobility and situational awareness to concentrate combat effects at successive decisive points of its choosing is no more than the evolution of Jomini's concept of interior lines. Armies could be dispersed, according to Jomini, only if their march rates and operations on interior lines allowed them to mass against the enemy at the decisive point.⁷ On a myriad of minor points, *FM 100-5* practically quotes Jomini word for word: "Decisive points provide commanders with a marked advantage over the enemy and greatly influence the outcome of an action;" "A force operates on *interior lines* when its operations diverge from a central point... on *exterior lines* when its operations converge on the enemy;" "Military forces defend only until they gain sufficient strength to

attack;" and "An effective defense is rarely passive. The defender... seeks every opportunity to conduct offensive operations such as local counterattacks."⁸ An attentive reading of *FM 100-5* thus clearly reveals the strong influence of its Jominian underpinnings.

Doctrine does not exist for its own sake, of course; its purpose is to shape and guide the conduct of operations and training. It is, therefore, to be expected that Jominian thought should be present at an institution like the US Army Command and General Staff College (CGSC). Indeed, after nine months of instruction, the author found it difficult to escape the conclusion that Jomini walks the college halls and is, in fact, regularly attending class. In exercise after exercise, CGSC students reject the art of war in favour of its science, paying lip service to the psychological dimension of war in passing as they get on with the "real" business of analyzing force ratios and synchronizing the effects of battlefield operating systems at the decisive point. In one particular exercise attended by the author, a painstakingly crafted brigade-level plan was executed using the Janus simulation system. Victory was eventually declared despite the fact that one of the brigade's task forces was decimated and another reduced to half strength, leaving the author apparently alone in wondering what the psychological impact of this action would be on its survivors, and whether a less "decisive" course of action might have been preferable.⁹ Students spend vast amounts of time developing staff "products" whose purpose is to

provide data for the deliberately analytical Military Decision-Making Process. Even qualitative judgements like the weighing of the relative merits of various courses of action were assigned quantitative “values” to lend an air of deterministic certainty to planning. The implication that success will be best assured if all the products are prepared, all the boxes are checked, and all the battlefield effects synchronized is distinctly Jominian.

None of this should be surprising given the Jominian flavour of the Army’s current doctrine manuals, but the role of computer-driven simulations gives pause for additional thought. Because the dynamics of leadership, morale, and friction are essentially unquantifiable, the analysts who construct computer simulations and models deliberately ignore them.¹⁰ These qualitative aspects of warfare are probably at least as influential in determining the outcomes of warfare as are the quantifiable ones, but the use of simulations at CGSC and elsewhere reinforces the Jominian tendency to overlook the psychological and unpredictable aspects of war.

Jomini’s ideas, which have influenced US Army doctrine and practice for so long, will continue to do so for at least the near future for several reasons. The reduction of military endeavor to its measurable, quantifiable aspects is attractive to an army in peacetime because “facts” and “statistics” help convince lawmakers to devote adequate budgetary resources for the army’s purposes.¹¹ Computer simulations and operations research models will continue to provide the necessary “analysis” and “facts” to justify the procurement of advanced technology and new weapons at the expense of insight into the unquantifiable aspects of war, all the while providing training to the next generation of Army officers. These future senior leaders of the US Army—imbued as they have been with Jominian ideas about the immutable principles of war, the imperative of massing overwhelming combat power on a decisive point to achieve decisive victory, and a disregard for the psychological dimension of war—will be resistant to changing their minds. But ultimately, the most compelling reason to predict Jomini’s continued relevance has more to do with human

nature than any other factor, since his approach “... appeal(s) deeply to generations of soldiers (who)... respond strongly to Jomini’s insistence on unchanging truth...” His way of thinking about warfare has not disappeared because it meets a pressing need to describe the apparent disorder of war with principles that can be understood.¹² Regardless of how appropriate such constructs remain in analyzing future warfare, it would appear that Jomini, at least as a security blanket, is here to stay.

Note: This commentary was prepared by Lieutenant-Colonel Saulnier for the academic portion of the US Army Command and General Staff Course, which he attended in 1998 and 1999.



ENDNOTES

1. J.D. Hittle, “Jomini and his Summary of the Art of War,” in *Roots of Strategy*, vol. 2, Harris-

burg: Stackpole, 1987, p. 396.

2. Department of the Army, *Field Manual 100-5 Operations*, Washington D.C., June 1993, p. iv.

3. John Shy, “Jomini,” in *Makers of Modern Strategy*, ed. Peter Paret, Princeton: Princeton University Press, 1986, p. 146.

4. Crane Brinton, Gordon A. Craig and Felix Gilbert, “Jomini,” in *Makers of Modern Strategy*, ed. Edward Mead Earle, Princeton: Princeton University Press, 1971, p. 90.

5. FM 100-5, pp. 2-4, 2-6.

6. Ibid., pp. 2-4, 2-5.

7. Brinton et al., p. 86.

8. FM 100-5, pp. 6-7, 9-0, 6-20.

9. This unwillingness to examine the larger context of war is all the more surprising given the consensus among Army officers that America is unprepared to accept such heavy casualties, and that their political and psychological effect would result in the defeat of US forces.

10. Robert Leonhard, *The Art of Maneuver*, Novato: Presidio, 1991, p. 139.

11. Ibid., p. 138.

12. Shy, pp. 176, 184.

Combat Service Support (CSS): Stop the Madness!

By Lieutenant-Colonel R. Préfontaine, Directing Staff, Canadian Land Force Command and Staff College

I recently attended a conference intended to serve as internal assessment of Army support capability and to identify steps to take to implement the CLS’s strategic vision. During the two days of the conference, I was surprised by the comments and proposed options. In fact, the impression I got from the syndicate was not that of having tried to find solutions to what lies ahead, but rather of having taken part in a group therapy session where participants were still trying to find a way to make a concept work that has never been effective since it was created in 1996. The comments and options offered at the conference led me to a single conclusion: STOP THE MADNESS!

I have been involved in the Close Support (CS) / General Support (GS) process from the beginning. My colleagues and I helped conceive and give birth to the baby, introduce it to its brothers in the areas, and then, one day, some of us realized we had created a monster that could not be easily returned to the test lab it was born in.

The basic problem behind the confusion into which Army Combat Service Support (CSS) has fallen is not due to poorly developed doctrine (though it does need minor revision), nor is it due to incorrect identification of our needs or deficiencies in terms of equipment, nor to the management of our preparedness level, nor to the fact that all operational Army CSS resources have to be transferred to the Area Support Group (ASG) garrison support structure. The problem is actually far simpler. The real problem that is eating away at Army CSS, that is making it stagnate and dividing the CSS community is actually comprised of a number of reasons: **the need for direction in the Army, the need to redefine the terms CS and GS, the realization that ASGs are a garrison structure** that has nothing to do with the development of Army CSS capability, and the fact that we have to **simplify Army CSS command and control (C2)**, otherwise we will still be trying to decide who does what in 2020.

The need for direction in the Army. The Army never said it did not support the concept of CS/GS. But at the same time, it never made the necessary effort in terms of the equipment and training required in order for the two organizations (CS and CG battalions) to be able to coexist. It was unable to take the necessary steps to officially recognize the concept as the funding was not available. Frankly, I do not believe the Army will ever have the funds to train and equip two service battalions per area, when originally there was only one to train and equip per area. It is not by taking equipment away from Reserve units, contrary to what some of my colleagues seem to suggest, that we will solve this problem. The Army cannot support such a concept; it simply does not have the means. However, it must guarantee its CSS capability in the event of Main Contingency Force (MCF) deployment, and that means training its CSS elements. In attempting to train CS and GS, the Army has had to work double time. With a clear direction for what it considers its essential capability, we will cease to fight over resources that will never come (this is a brutal but very real fact). This essential capability must be its brigade-group service battalions and its field ambulances. This direction must be given very soon.

The need to redefine the terms CS and GS. This is certainly the foremost problem behind the stagnation of Army CSS. We have tried from the outset to implement the CS/GS concept, which is a war structure with peacetime resources. It is like trying to fit a square peg in a round hole. It was I, as a G4 at the time, who sold the idea of this restructuring in my area, to the area commander and the service battalion commander. Today, I must admit the error of our ways. Although the original intention was noble, I now realize that we do not have and never will have the resources to establish wartime structures and that, by trying to protect CS and GS resources, we unwittingly increased the Army's fiscal pressure. The concept has changed so many times since the beginning because we could not adapt it, and today, after six years of boisterous arguments, we still cannot agree. We are not adapting brigade-groups to wartime establishments, so why should we do it for CSS? So much for implementing the concept.

Another realization concerning the concept was that we must redefine CS. This level must represent services provided to the brigade by its CSS units. Currently, responsibility for administratively supporting a brigade-group (from a materiel point of view, I am not talking about medical aspects here) is split between two commanders, who must both provide support required for training. A new description of CS, identifying it on a tactical level, could confer responsibility for tactical support on the brigade-group. Support behind the brigade-group could be associated with GS and operations, and be assigned to the Joint Support Group (JSG). That way, the Army would have the responsibility of developing tactical doctrine and maintaining this capability, while the JSG would take care of operational and strategic doctrine. Of course, CS would have to include all supply and maintenance services that a brigade-group needs, and that includes more than combat supplies and type-A vehicle repairs. Without going so far as to bring service battalion establishments up to their levels prior to 1996, we must give them the capability to support a brigade-group.

ASGs are a garrison structure. This is the second biggest reason for our problems. ASGs are nothing more than a stationary structure, replacements for bases that were once administrative units whose purpose was to provide administrative services not related to operations and training. We must realize this, or we will find ourselves continually returning to square one. By trying to give this stationary entity operational responsibility, we are separating C² from the areas' only deployable formation for domestic operations, training and the development of Army operational capability, and we are diluting the development of Army culture in our soldiers/technicians. Some, perhaps, prefer to remain close to operations because it is attractive. But someone has to focus on garrison support. Someone has to make sure, for the Army, that garrisons are properly administered so that there are funds left over for training brigade-groups and garrison administrative services are well established when our soldiers need them. When we talk of setting the entire Army's CSS strength under ASGs, we are putting all our CSS capability under a garrison structure. Six

years ago, CSS establishments were under the brigade-groups. We took away from them the personnel required for garrison support, which was excellent, but we also took away part of their CSS capability. If we now bring the rest of this CSS capability under ASGs, we will have put the entire CSS capability back together but under a garrison commander. Where is the logic?

Simplify the Army CSS C² and its garrison support. C² must be simplified. We must leave operational support to brigade-groups and leave garrison support to ASGs. Partially reducing brigade-group resources, increasing CSS support between both organizations, and asking a garrison structure to get involved in the Army's operational development will lead us nowhere. CSS and garrison support each have their own responsibilities and each has an essential role to play in Army structure. But at the same time, they each have a different purpose and different mission. That has to be recognized, for if we ignore it, we run the risk of undermining both organizations. The day the country needs us and finds us only half prepared, who will be there to make excuses for our lack of preparation?

We must put a stop to the diluting of this combat function. We must stop thinking that we will never need to deploy the Main Contingency Force brigade-group and stop thinking "Why train? Let's just direct all our resources towards ASGs." Who could have predicted the events of September 11? Who can predict what is still to come? Those who think like that have forgotten why they are in this army and might want to consider changing uniform. The CSS community must be reunited in spirit, and that requires going back to basics and establishing the clear chain of command that once existed. Otherwise, we will be just as lost in our discussion twenty years from now, and the Army will have no more resources with which to equip and train a wartime structure with peacetime resources.

STOP THE MADNESS!



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